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IMMORTALITY OF THE SOUL

VOICED BY NATURE.

R. T. P. ALLEN.



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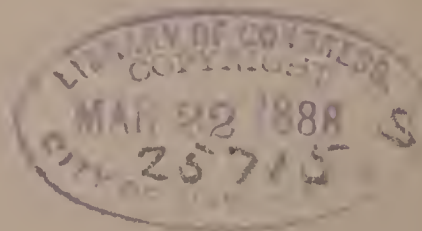
Christianity in Accord with Science.

—BY—

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WITH AN INTRODUCTION BY REV. J. H. YOUNG, Ph.D.



NASHVILLE, TENN.:

SOUTHERN METHODIST PUBLISHING HOUSE.

1887.

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INTRODUCTORY NOTE.

UNDOUBTEDLY the world is greatly indebted to the scientific research of the nineteenth century for the wonderful light it now enjoys in every department of study. The progress of the physical sciences during this period has been truly phenomenal, while other branches of learning, such as the mental and moral sciences, history, theology, etc., have been comparatively at a stand-still. The reasons for this are apparent. The physical sciences are based upon the postulate of the continuity of law. All ideas of chance, or even of supernatural interference, have been rigidly excluded. This continuity of law, founded upon an induction as wide as the range of facts within the observation of man, has been the key with which science has opened many a door in the *arcana* of the universe. By it the observer is required to classify every phenomenon, and this classification is science. But theology, history, and cognate branches have not enjoyed hitherto the privileges of the inductive methods. Their conclusions have been reached by the natural process of deduction, and hence they have watched with jealous eye the advances of the opposite method. Viewed in this light, these sciences have been comparatively stationary for the want of new revelations or facts in order to institute new deductions. Theology in particular has always been rather shy of the advances of science. Science would fain form a coalition with her, and hand in hand set out for the discovery of even the "hidden things of God." But theology has always treated these advances with distrust, and shown a positive unwillingness to acknowledge any obligations to the so-called discoveries of the human intellect. But, happily for us, the light is now becoming so strong that even the blind may see. The generalizations of science are throwing light even upon revelation, so that "invisible things of Him from the creation of the world are clearly seen, being under-

stood by the things that are made, even his eternal power and Godhead."

We regard the present age as the dawning of a new era in the science of theology. Men no longer seek for truth in musty tomes. The voice of antiquity is becoming too distant to be heard clearly amid the bustle and activity of a progressive age. Authority itself must give a reason for its *dicta*, or show that they are in harmony with established law. This is as it should be. Theology has no reason to fear the pride of human intellect. Let it but keep abreast of the spirit of the age, and it will command the respect of every thinking mind. It is only when theology lags behind, in company with ignorance and blind superstition, that it provokes the contempt of science. It has long been the complaint of theologians that science seeks to reduce every thing to the crucible of experiment. This "crucible of experiment" is a very indefinite phrase; but if it is meant that all facts or truths should be subjected to a thorough examination to demonstrate the presence or absence of law, then give us the "crucible" all the time.

He who is accustomed to observing the "signs of the times" has not failed to note the fact that after so long and bitter oppression theology is at last availing itself of the postulates of science in the demonstration even of fundamental truths. We might adduce the works of the Duke of Argyll, Henry Drummond, and a host of others in evidence of this fact. We owe these pioneers in this new field of theological investigation our profoundest gratitude.

And why should we not avail ourselves of every means afforded us of demonstrating the truth of our holy religion? If science can give us any help, then why despise it? The laws of God are eternally the same, and are never in conflict with each other, whatever may be the form of their expression. Call them "laws of nature" or "laws of grace," it matters not; they are but different expressions of the same principles pervading all things. If science can, by its inductions, discover to us the mode of action of any principle or law in the natural world, we may not be surprised to observe the same

mode of operation in what is called the spiritual world. If we find it will not work, something is wrong either with the induction or with our received theology. Seek, then, for the *truth*. Surely we have nothing to gain by the establishment of a false theology any more than a false science. What we want is the truth, whencesoever it may come. The time has come for the Church to cease regarding all scientists as incarnate demons seeking her disruption and ruin. They have more than once proven to be her best friends.

Many of the so-called "conflicts" of science and religion have already fallen in line with accepted truth, and are now employed in the inculcation of the faith of the gospel of Christ. The God of nature is the God of revelation. He has revealed his glory not only through the word of inspiration, but he makes the "heavens declare" the same, and the "firmament to show his handiwork." Science and religion are therefore inseparable. "What God has joined together" let no man with ignorant presumption "put asunder." Theology is everywhere beginning to recognize this truth, and in consequence the same old doctrines of revelation stand out before us in clearer light. Nor is this light the less valuable in that it enables us to distinguish between the opinions of men and the truth of God. What in the twilight of our knowledge we fondly supposed to be living verities are now known to be only the embalmed mummies of tradition, while the real truths of revelation appear with even greater certainty.

For these results we are largely indebted to that class of scientific theologians who have fearlessly applied the inductions of science in support of the evidences of Christianity—a class, we are glad to see, which is everywhere rapidly increasing. They are the hope of the Church for the future. To them we must look for the rational defense and the establishment of our faith, for the world has passed the stage of childhood, and no longer accepts authority unless accompanied with the why. We welcome, therefore, the appearance of every such light upon the intellectual horizon, assured as we are that religion has every thing to gain and nothing to lose.

It is really a question to what extent theology is responsible for its so-called conflicts with science. Many facts which formerly were regarded as diametrically opposed to revelation are now among the props of our faith. And it may be that what now appears to us the noise of battle between the contending hosts shall prove in the light of the coming day but the souging of the bellows and the clang of the hammers forging for us a citadel of impregnable truth. But still there are probably as many scientists who are ignorant of theology as there are theologians who are ignorant of science, and there is little doubt that along the line of this mutual ignorance most of our "conflicts" come. The better they become known to each other the more hope of a permanent union. As already intimated, many of the greatest minds in both of these departments of study are now endeavoring to encompass this end. Through their combined efforts we may yet learn that there are many great truths in the universe of God never before dreamed of in our philosophy.

And now in this same general line comes the present volume. We hail it with greatest pleasure, and bespeak for the author a gracious reception at the hands of the reading public. We feel a peculiar pride and pleasure in this work, coming as it does from our old friend and preceptor in the things of God. Of the author's ability and fitness for the task he has essayed, the book itself is evidence. Gifted by nature and by grace, he has brought to this undertaking a mind well stored with facts and a heart filled with love to God and man. An earnest Christian, a progressive theologian, and a practical scientist, he unites the qualifications necessary for the faithful investigation of the subjects he has in hand. In many respects the field of his investigations is entirely new. He explores territory but faintly outlined by those who have gone before. But his tread is confident, and the result of his work such as to command the respectful and serious attention of all thoughtful readers.

Perhaps it would be too much to say that all of the author's conclusions will meet with universal assent. *That* has rarely, if ever, been the fortune of any book. But we may say we doubt not the reader

will feel the grasp of a master-mind at every step. Whatever estimate he may place upon the positions assumed or proven, he will be struck with the author's honest, patient, and reverential search for the truth. Truth is eternal, and by it alone the glory of God and the welfare of man are conserved.

May the book gain the wide circulation it richly deserves!

J. H. YOUNG.

Winchester, Ky.

PREFACE.

DURING the summer of 1885 the author read a notice of a lecture delivered before an assembly of ministers of the gospel, in which the lecturer was represented as saying that "nature gives no shred of evidence of the immortality of the soul."

He was astounded at the assertion. "Can it be possible," he thought, "that an assembly of gentlemen, supposed to be men of culture, could allow such an assertion to pass unchallenged?"

For many years he had taught his classes that nature, or the God of nature, had impressed upon each one of his creatures features that infallibly pointed out its destiny in the divine intention; and if this be true, if it be a universal law, then *nature* must unmistakably point out *man's* destiny.

The following work is the result of his investigations in that line of thought. He has, it will be seen, made large use of such works as fell under his observations containing matter germane to this line of thought, as those of Mr. Herbert Spencer, the Duke of Argyll's "Reign of Law," "The Unseen Universe," Drummond's "Natural Law in the Spiritual World," "The Vestiges of Creation," Bushnell's "Nature and the Supernatural," and the geological works of Dana and LeConte.

If the work shall in any degree help to stem the appalling tide of skepticism that threatens to overwhelm the nation's most precious interests, he will be more than satisfied.

THE AUTHOR.

Farmdale, Ky.

INTRODUCTION.

Tendency of Science. The tendency of this scientific age is to ignore every thing that cannot be brought to the test of the senses, or be directly deduced from the phenomena of matter or the forces proceeding therefrom. This clearly leads to a bald skepticism of all existences outside of the visible universe.

If any thing whatever be brought to the attention of the man of science that cannot be stated in the terms of his present knowledge, "he shakes his head and turns aside." He forgets that in his exploration of nature, in whatever direction, he is presently brought to a halt by an impenetrable wall, beyond which he cannot but know there must be forces, or entities, or both, acting upon things on his side of the wall, thus demonstrating their *existence*, while their *nature* is, and perhaps must forever be, beyond the reach of his utmost endeavor, and *therefore not to be stated in the terms of the rest of his knowledge*.

It is the purpose of the author, in the following pages, to inquire into the justness of this attitude of the scientific mind, and to endeavor to ascertain if other things beyond the merely *sensible* do not appropriately, even scientifically, claim the earnest, the most profound attention of the scientist while in search of the truth. We take it that no sane man would be content to build his house, the guard of all his treasures, upon falsehood, sure that the coming storm, which is to try all things, would inevitably sweep it away and leave only wreck and ruin behind. We must desire above all else to ascertain the exact truth, and if this be

not ascertainable, then to get as near to it as we possibly can.

The questions that it would seem should be nearest the heart of every sane man are: "What is to be my destiny? Who and what am I, and why am I here, and whither am I bound?" In other words, to find out, if he may, man's true place in nature—that is, to find out in regard to himself the *whence* and the *whither*, and how far the *whither* may be affected by his *conduct* in the present.

Now, the author is confident that nature herself, if rightly questioned, will give an intelligible answer to these important questions, and that we may thus arrive at a reasonable certainty in the matter. In this investigation the author will confine himself, as well as he may, to what he sees in nature, and telling what he hears from her. But before proceeding to a direct consideration of the subject before us, let us test the reasonableness of the scientist's position, that if his attention be invited to any thing that "cannot be stated in terms of the rest of his knowledge, he shakes his head and turns aside." (Frederic Harrison.)

Let us suppose that in the mineral world some crystal is possessed of life and reason. And why not? for do not some scientists suppose that life of some sort resides in mere matter? This crystal of which we speak has become acquainted with the laws of matter, with the properties of all the elements, has observed the laws of chemism, and has proved his science from the multitude of phenomena about him.

There is no such thing as self-motion in his science; it has not entered into his vocabulary. You propose to tell him about a higher life than he has known, of plants and animals which have never come within the cognition of his mineral senses. He "*cannot state them in the terms of the rest of his knowledge, and so he shakes his head and turns aside.*"

Again, perhaps, some plant may have sensation, a degree of thought and faculty of observation; at least, we may suppose it possible that it has mastered all the phenomena of the vegetable world, and constructed its science of botany; has attained to a knowledge of all the laws of plant life, both morphological and physiological. You go to it—a rose, say—and propose to tell of self-moving things, which see, hear, smell, taste, and have great happiness in their life. It will answer: “In science neither minerals nor plants have any such properties. *Here, just here*, I began to be, and here I shall die.” And it is so with all things in the world. I know the laws that govern all things, mineral and living, and when you propose to me things “dispartate from the rest of the world, and that cannot be stated in the terms of the rest of my knowledge, I shake my head and turn aside.”

As we would reply to the crystal and to the plant, may we not say to the scientist: “Your science of the mineral, of the vegetable, and of the animal ignores the grand and glorious science that tells of *universal being*. Lift up your eyes and see evidences all around you of a Being unseen! Open your ears to the voices that come everywhence, telling of the glory and the grandeur of a universe not open to poor, darkened, physical vision! Listen, O listen, to the grand chorus of halleluiahs to their Author that arise with glorious symphony from the multitudinous hosts of earth and sky. ‘For the invisible things of him from the creation of the world are *clearly seen*, being understood by the things that are made, even his eternal power and God-head.’” (Paul, in Rom. i. 20.)

It has been stated in recent days “that *nature* gives no shred of evidence of man’s immortality.” Now it appears to the author that such utterance has been made without due consideration, since nature most surely gives direct

evidence of the strongest kind on the subject; such evidence, indeed, as to compel the true scientist to accept man's immortality as a *scientific necessity*. This evidence, at least in part, the author proposes to point out in the following pages.

CHAPTER I.

§ 1. Nature. By this term are to be understood all things whatever of matter or mind which are in the visible universe, with their properties and the forces with which they act upon each other or are acted upon, whether from within or without it. And if it should happen (as is the fact) that entities exist that are not cognizable by sense, and yet are vehicles of force in the multitudinous movements of things, these must also be taken as belonging to the domain of nature. Thus the term includes all matter, and whatever else exists, both of this earth and of all worlds, with all the phenomena connected therewith, all organisms with the life that is manifested in them; and since life in the organism often evidences the presence of mind-intelligence of various degrees, this mind also comes under nature's domain, as declared above.

It is not a question *now* of the *how*, the *what*, or the *why* of things; in many respects these are inscrutable, and may ever remain so. Our concern is to contemplate these facts and their relations to one another, and to discover, if we may, the laws that govern in the orderly sequence of things; and these being ascertained, we arrive at a knowledge of *science* which presents to the mind—the intellect—the *truth*, so far as a knowledge of it is attainable in man's present condition.

§ 2. It must not be forgotten that when the scientist proposes theories to account for phenomena, however plausible they may be, however they may commend themselves to our judgment, yet an appeal to facts must always be made. If the theory be found to agree with all known facts, it may

be provisionally accepted as true, or at least as probably true; but if the facts of nature do not conform to the theory, it must certainly be abandoned, and some other mode of accounting for things be adopted if possible. The appeal to experiment must ever be made where possible.

History is replete with examples proving the proneness of men, even of the greatest thinkers, to error when theorizing from only a partial knowledge of facts. How often have conclusions been drawn in almost every branch of human knowledge, only to be abandoned upon further investigation of the facts of nature! Theories that were very beautiful, very satisfactory to judgment for awhile, yet utterly repudiated—abandoned upon further advance in knowledge. With all due diffidence we claim the privilege of saying that there is much in the admitted science of the day that upon further examination will have to be abandoned.

It will be perceived that the author includes in the term *nature* all that is, visible and invisible, in this and all worlds. Whatever things the phenomena cognizable by man—whether of matter, of life, of mind—compel us to recognize these things come under the domain of nature.

§ 3. Science. A knowledge simply of facts as observed on every hand throughout nature does not constitute *science*. One might possibly be acquainted with all the facts of nature without any conception of their *relations*. Confused and confounded by the multitudinous mass of isolated facts obvious to his senses on every hand, let him begin to arrange these facts in classes according to their resemblances; then he will find them arranging themselves in his mind in certain definite lines, until out of utmost confusion order arises, and finally a glorious *cosmos* stands revealed before him—the grandeur of an unspeakable beauty. This classified knowledge is *science*. Science, then, reveals the lines along which nature acts with unvarying uniformity—

in other words, her mode of doing things. These modes of nature's acting, her ways of doing things under ever-varying conditions, are called *laws of nature*. These laws will not all be fully known nor science complete until all phenomena shall be known, and shall be arrayed in one vast circle, whose *radii* shall be the fully ascertained laws of nature, uniting *all that is* to its great source, the center.

"By science," says Huxley, "I understand all knowledge that rests upon evidence and reasoning of a like character to that which claims our assent to ordinary scientific propositions. If any one is able to make good the assertion that his theology rests upon valid evidence and sound reasoning, then it appears to me that such theology must take its place as a part of science."

Mr. Frederic Harrison says: "We say life and conduct shall stand for us wholly on a basis of law, and must rest entirely in that region of science where we are free to use our intelligence in the methods known to us as intelligible logic, methods which the intellect can analyze. When you confront us with hypotheses, however sublime and however effective, if they cannot be stated in terms of the rest of our knowledge; if they are dispartate to that world of sequence and sensation, which to us is the ultimate basis of all our real knowledge, then we shake our heads and turn aside."

The author of these pages accepts with confidence the terms thus stated by these eminent scientists, and hopes to show that *his* theology must take its place as a part of science on the terms stated by the one, and so to place it on the basis of intelligible logic as required by the other that it shall stand on the basis of law fully entitled to regulate the life and conduct of all men. He hopes to show that his theology is in perfect harmony with, and not "dispartate to, that world of sequence and sensation which to us is the ultimate basis of all our real knowledge;" so that Mr. Har-

reason shall not be permitted, consistently with right reason, "to shake his head and turn aside."

Yet we must not forget that close around all human knowledge there hangs an impenetrable veil of mystery; and that, as "a science without mystery is unknown," so "a religion without mystery is absurd." Upon examination it will be seen that there is not a whit more mystery in theology than in nature. The intelligent Christian can have no fear of science; truth cannot antagonize truth. No sane man would knowingly build the fabric of his hopes on error. If religion has no basis in scientific truth, we wish to know it; and then what? "Let us eat and drink, for to-morrow we die." "If in this world only we have hope in Christ, we are of all men most miserable." (A better translation would be *most to be pitied*.)

§ 4. Laws of Nature. The idea of law in this sense must be carefully separated from the idea of *force* or *underlying cause*. In speaking of nature's laws, we refer only to the orderly sequence of things—their mode or manner of being or acting—not at all to the *causes* of phenomena. These causes or forces that produce the orderly working or manner of procedure of things may be unknown—may be, in fact, beyond the reach of the human intellect, and yet the *law* be ascertained fact.

Phenomena are objects of sense; not so laws. These are "dispartate from the world of sense." Phenomena—objects of sense—classified, reveal to the mind laws, which are thus matter of pure reason. Thus *science* is solely based on the establishment of laws, and thus itself becomes matter of pure reason. Phenomena-facts are important only so far as they go, when classified, to the building up of the fabric of scientific truth. Every fact, therefore, when classified with related facts, goes beyond the domain of *sense* into the realm of pure reason. Every effort, therefore, to classify objects of sense, to formulate a science, is to assume

principles or laws which are themselves “dispartate from the world of sequence and sense,” since laws are discovered by purely mental processes. Phenomena, as said above, are objects of sense. Classify these phenomena, and you have a something not in the realm of sense.

The ancients had no just conception of natural law; were occupied wholly with the phenomena—the discrete facts of universal nature. They never attained to a conception of law. To *them* the world of visible things was not that *cosmos*, that glorious harmony of universal order, that it has become to us. The men of deepest thought—indeed, the philosophers of olden time—did endeavor to discover the order, the mode of nature’s working; but in vain, as witness the fantastic theories invented to account for the phenomena of nature. It was not till the times of Copernicus, Galileo, Kepler, and Newton that the true order of the universe began to dawn on the human mind, and science to be established on a firm basis.

But it must not be forgotten that these sages and their followers did not discover the *causes* of things, but their order of sequence only. Newton did not discover gravity. He made known to science *gravitation*, the *law* of gravity; thus the *cause* of gravitation is still unknown—a wonderful, unexplained fact, the cause of which is not only unknown but inconceivable—a law that first, in the human mind, introduced earth into the family of the stars of heaven. Thenceforth facts were only examined in reference to the establishment of law, and to this end the investigation of phenomena by scientists was subordinated to the establishment of *law*. Now we know all things to be under the reign of law—all things, visible and invisible, in all the universe. Of this we are assured, and herein securely rest.

All nature’s laws are a part of science, and all together they form the entirety of science; whence it will be seen that science itself is “dispartate to the world of sequence

and of sense," and yet in it we stand face to face with truth, solid and unchangeable.

The Duke of Argyle says: "The reign of law is the reign under which we live. The whole world around us and the whole world within us are ruled by law. Our very spirits are subject to it—those spirits which yet seem so spiritual, so subtle, so free. How often in the darkness do they feel the restraining walls—bounds within which they move, conditions out of which they cannot think. The perception of this is growing in the consciousness of men. It grows with the growth of knowledge. It is the delight, the great reward, the goal of science; and from science it passes into every domain of thought." ("Reign of Law," p. 55.)

What then are these laws? Of some of them only we propose to speak, absolutely certain that the consideration of them will lead us logically to the end proposed—viz., the evidence of nature on the question of man's immortality.

But before proceeding in our discussion we lay down as an incontrovertible fact that the law of every thing in nature, living and non-living, grows out of its properties, faculties, nature in constitution—*e. g.*, the mode of action. The law of each and all the elements is the result of their properties. It seems a mere truism, and yet the observation is important in its bearing on our line of thought. Again, of every *living* thing it may be also affirmed that *its* law is coeval with its existence, determined by its form, faculties, constitution. Nature thus indicates its intended mode of life—the destiny of every living thing.

§ 5. Matter. Of the real nature of matter science tells us nothing. *That* is among the impenetrable mysteries that surround us on every side. Of its properties only, the phenomena it presents, science takes cognizance, and for these properties we refer the reader to scientific treatises on the subject.

The doctrine of the atomic constitution of matter is generally accepted by scientists, and yet it is absolutely unimaginable, since the human mind cannot grasp the infinite, and the atom is infinitely small. Here, then, be it noted that scientists accept the unimaginable as *fact*, as they also do in many other departments of nature.

Matter is *supposed* (not certainly known) to consist of sixty-six different elements, each of which has its own peculiar properties—laws, modes of action—while all are subject to the laws of matter as such. Each element has certain affinities for certain other elements, while indifferent to all the rest. Now the laws of chemism are such that the elements always unite in certain definite proportions, and that if two or more elements unite to form a certain compound under certain conditions, then under the same conditions they will always and everywhere unite to form the same compound. Thus Hydrogen and Oxygen unite, under certain conditions, to form water, two atoms of H combining with one atom of O, as when H is burned in the atmosphere or in Oxygen, and they never unite directly in any other proportion. And when Carbon is burned in air or in O, one atom of C combines with two of O to form a molecule of (CO_2) carbon dioxide, and whenever Carbon unites *directly* with Oxygen it is in this proportion. And we have no hesitation in adding that, if elements unite otherwise than under these simple laws of chemism, *science, to be true to herself, is compelled to recognize as present a force outside of matter compelling the combination.*

§ 6. In addition to this law of chemism, we propose to examine certain other laws of nature, as follows, seeking to find out at every step what they tell us (if any thing) of the how, the what, and the why of things:

1. The law of gravitation.
2. The law of catastrophe.
3. The law of luminiferous ether.

4. The law of life, origin of, development of, etc.
5. The law of conformity to type.
6. The law of adaptation.
7. The law of instinct.
8. The law of continuity.

In considering these laws of nature we shall find at every step the absolute necessity of postulating a force from *without* the visible universe, operating in nature, directing and controlling the forces of nature, co-ordinating all things according to the counsel of His own will; for it will become abundantly manifest, in the course of our argument, that this "force that makes for righteousness," as postulated by all scientists, possesses the attributes of personality.

§ 7. Law of Gravitation. The statement of this law is simply that every molecule of matter in the universe attracts every other molecule of matter, and that the attraction between masses of matter *varies directly as the product of the masses and inversely as the squares of the distance between them*. This is what is called the *law of gravitation*. We say *attracts*, but should rather say that the masses behave *as if* they attracted each other, since it seems inconceivable that such attraction should really exist. No satisfactory hypothesis as to the *nature* of gravity is known to science. Here we have a *fact* known, not to scientists only, but to all men, exhibited in all things, which cannot be accounted for, the very statement of which *involves the unimaginable*.

§ 8. Gravitation continued. It is the universal opinion of scientists, and must therefore be accepted as the doctrine of science, that the present condition of the solar system, and indeed of all systems, is the result of the orderly working of gravitating molecular and chemical forces. It is believed by most scientists that at some time in the remote past the matter that constitutes the sun, with all his attendant planets and their satellites, was in a nebulous condition, occupying the entire space within the orbit of the farthest

planet, and indeed extending far beyond, probably *half-way* to the nearest fixed star.

Now the diameter of Neptune's orbit is say 5,700,000,000 (five thousand seven hundred millions) of miles, and if the nearest fixed star be 7,000 (seven thousand) times as far from the sun as Neptune, we would have this matter occupying (diffused through) a spherical space of say 20,000,000,000,000 (twenty millions of millions) of miles in diameter, the nebulous matter being, as will be seen, of inconceivable tenuity. This matter would necessarily gravitate toward the center of the system—that is, toward the center of the sphere—and if no other motion were given to the matter it would result in *one central mass*. It must therefore be conceived as having another motion—namely, of rotation from west to east.

We may well pause to ask, Whence this rotation? Gravitation acts only radially, and could not cause motion perpendicular to its own direction. We are aware that it has been ascribed to vortexes in the descending fluid mass; but these vortexes, if existent at all, would be local and separate, and whatever momentum any one vortex had in any one direction, there must necessarily result an equal momentum in the opposite direction, and *the sum of all the movements at right angles to the gravitating force would be zero*, while in fact the rotating mass must have had an enormous momentum from west to east. Besides, if we should admit the postulate of innumerable vortexes all in the same direction, it is inconceivable that the infinite number of vortexes should coalesce into a well-defined, uniform *rotation* of the entire mass. It would appear evident, therefore, that this motion must have been given by a force *ab extra*, even the will of an infinite power working with purpose.

In view of the law of conservation of energy, it must be taken as the doctrine of science that all of the almost inconceivable energy of the moving orbs of the solar system—

the energy of their revolutions around the sun, as well as that of their several rotations on their own axis, and of their revolving and rotating satellites—must have been resident in the first rotating nebulous mass; and as this energy was in direction of movement *perpendicular* to the gravitating force, it could not possibly have resulted by vortexes or otherwise from that force. Hence, the necessity that science should postulate a force *ab extra* impressed upon the nebulous mass causing the rotation. This tenuous fluid mass contracting under the gravitating force, with rotation being given, we can trace in thought the evolution of the solar system as we see it to-day. Thus: As the mass contracted the rotation would increase in rapidity, the sphere taking the form of an oblate spheroid, until the centrifugal force (we choose to call it a force) of the outward equatorial mass became equal to the centripetal, when that portion of the matter would no longer follow the inner portion of the spheroidal mass in contracting, its gravity being exactly counterbalanced by the centrifugal tendency or force, it would be left behind as a circular ring of matter, continuing its rotation from west to east; and unless this ring were homogeneous throughout, as it was not likely to be, it would break at some point—its weakest—and, drawing in its broken extremities under the action of gravitation, it would finally itself form an oblate spheroid revolving around the center of gravity of the system and rotating on its own axis, its rotation increasing in rapidity as *it* too condensed, until *it* in turn threw off the outward portion of its equatorial mass, thus successively forming its satellites. Thus was Neptune formed, and the rest of the planets successively.

We said above that if the equatorial ring were not homogeneous, as it was not likely to be, it would break at some point; but if it were homogeneous it *could not break*, but must remain a ring forever. And this actually happened in the case of Saturn's system, where two rings re-

main much in the condition they were in when thrown off from their condensing primary, except being greatly flattened, as they must necessarily be by the forces acting upon their matter.

We further notice that as the nebulous matter contracted and became more dense its heat previously *latent* became *sensible*; so that each planet, each satellite, would successively become incandescent gas, and as the condensation and the cooling proceeded liquid matter, each and all of them at first self-luminous, too highly heated perhaps for the elementary substances to combine. As the cooling proceeded these combinations would take place, and when a crust was formed, and the temperature of the surface fell below the boiling-point of water, the Hydrogen and the Oxygen having previously combined, the watery vapor was precipitated, and an ocean covered the cooling world. Earth was thus once a vaporous mass; then liquid molten rock, covered with a dense gaseous atmosphere and watery vapor; then by a boiling ocean of water, and cooling continued until it has reached the temperature of the age of man. The moon has gone through the same process of evolution, until, being a much smaller body, she has already become a dead world.

In support of this nebulous theory we merely notice that in parts of the interstellar spaces irresolvable *nebulae* still exist, where we may well believe solar systems are in the process of formation, destined to go through all the stages that have marked the development of our solar system.

§ 9. It will be seen that this theory of the evolution of the solar system postulates a beginning in time. Matter cannot be eternal. It had a beginning; there must have been a time when there was no matter. Other considerations amply confirm this conclusion; for instance, the worlds of our system are cooling; the moon is already a dead world; the earth and the other planets, and indeed the

sun itself, must eventually become so. The sun's temperature is maintained, not by fuel supplied, as some have supposed, but by his progressive condensation. He has now but about one-fourth the density of earth, whereas finally he must become far more dense, heat being given off as the condensation progresses. And, after a certain degree of the condensation, the heat set free will no longer equal that radiated, when his temperature will begin to decrease—and then? The beginning of the end.

But if matter, subject to gravitation, be *eternal*, the process would already be completed; therefore, the evolution began in time. Matter had a beginning—“*nihil est nihil*,” therefore matter was made—created. Out of nothing? We do not know. Luminiferous ether, postulated by science, is not subject to the law of gravitation, while all matter *is*; therefore *it* is not matter. *It may* have existed from eternity, so far as the above reasoning shows. *It may* perhaps be the *substance* (the word is used in its etymological sense) of matter, as it certainly *is* if the vortex theory of the material atom be true. We will consider this substance further on.

We remark that we are driven to this conclusion in regard to the eternity of matter by the very laws of thought. Since a process not yet completed, but progressing continuously toward completion, excludes the idea of eternity in the past as regards that process; therefore, we are forced to the conclusion that there was a period in the past when *matter* was not, when it began to exist *as matter*.

Further, it has been well remarked that matter bears all the marks of a manufactured article, all its molecules being of the same magnitude, which is evidence of highest art, it being but recently that skilled artisans have been able to make the different parts of a machine so that they are easily replacable; so that, when a part, as a bolt or nut or screw, breaks, another is at hand to take its place.

It may perhaps be conceivable that a multitude of beings have existed from eternity; but when we go further, and claim for them the relation of quantitative equality, rather than the infinite number of relations of inequality possible, our claim becomes manifestly absurd. We are then compelled to admit for them a common origin or cause.

Finally, on this point we can only say that matter cannot be eternal. It was manufactured—made—and therefore there must be a maker, a creator of matter and of all things. Whether the scientist can conceive of him or not, science is compelled to postulate his existence.

CHAPTER II.

§ 10. Law of Catastrophe. By catastrophe is meant any interruption of secular procedure by a change, more or less sudden, of the action of the forces at work, or rather of their relative actions, so that a new order of things or of procedure is introduced; as when, during the secular contraction of the spheroidal nebulous mass, spoken of in Section 8, the centrifugal force became equal to the centripetal in the outer equatorial mass, that mass ceased its movement centerward, separating into a nebulous ring, breaking at its weakest point, and finally condensing into a planetary orb. And this happened in the case of each planet and of each satellite, in each case the operation of secular forces bringing about an equilibrium, after which there was a new order of procedure, all forces meanwhile acting regularly in accordance with law; so we see that there were as many such catastrophes as there are planets and satellites.

And now, turning our attention to the earth alone, and observing the evidence of progressive development from a molten mass, surrounded by highly heated gaseous matter, to her present condition, we find evidence of the same law of catastrophe at every step. Thus, as the cooling proceeded, and a thickening crust was being formed, it was broken up by every tide in the molten mass, and the separate masses of the broken crust were piled up in ridges, as in arctic regions ice is now piled; and when the superficial heat became less than 100° centigrade, the temperature of boiling water, the watery vapor was precipitated, and a universal ocean covered the earth—another catastrophe. And

then, under the action of internal forces, a portion of the ocean's bed was raised in parts to the ocean's surface or above, forming the nucleus of the present continental masses, while other parts sunk, forming the ocean's bed. We have here catastrophe after catastrophe many times repeated.

And now, tracing the progressive development as determined by geologic science from the archæan successively through the lower and upper silurian, devonian, etc., strata, we find a secular procedure in conformable strata, interrupted by an upturning, then violent denudation, catastrophe after catastrophe, and then other strata deposited unconformable to those below; another secular process, to be interrupted in turn by another catastrophe, and so on, many times repeated, as observed in every mountain region. This manner of procedure we find evidenced almost everywhere in the earth's crust, catastrophe ever following secular progress, and as essential to the perfected development as the secular progress itself. For instance, let us consider what took place in the region on the eastern slope of the Appalachian chain of mountains in New York, Pennsylvania, Maryland, and Virginia. In this region, then under the ocean, strata were formed many thousands of feet in thickness, and this in a shallow ocean. There must therefore have been a gradual sinking of the sea bottom, the deposits being made *pari passu* with the sinking; but many of these strata are unconformable, so that there is evidence that there was an upturning after the deposition of one set of beds before the unconformable beds above began to be deposited—a catastrophe; and finally there was a general collapse of the earth's crust in that region, a crushing together of strata over an extensive area, causing upturning, contortions, convolutions, foldings of strata, and that sufficiently sudden to produce the great heat requisite for the regional metamorphism, evidenced by the conversion of sed-

imentary into crystalline rocks, and the more or less complete change of bituminous into semi-bituminous or anthracite coal—a grand catastrophe.

Returning now to an anterior period in the earth's history, we find, after a certain progress has been made in the development of earth under the action of gravitating molecular and chemical forces, that in the hitherto dead world of matter alone, *life appears*, no difference how (that will be considered further on); formerly there was *dead* matter only, *now* there is *life*—the most astounding catastrophe of all, since here is a new force introduced into the arena of action destined to work the grandest results of all in earth's development. The *whence* of life is still the great puzzle of those scientists who are determined to ignore a personal Creator. Life having appeared, geology bears abundant evidence of continued development of organisms, generally (*not always*) from the lower to the higher orders of organic beings. And even in this development or evolution, if you will, the evidence goes to prove that the passage from one species to another was always catastrophic. Tracing the development, we note that, in passing from one series of beds to another series above them, there was ever a more or less complete destruction of existing species, and an introduction of new species—catastrophe after catastrophe many times repeated. Again, considering any one individual of the innumerable hosts of living beings, its life is closed by a catastrophe—death. Again, as illustrating this law of catastrophe, we point to the geyser. Here we see the gradual accumulation of forces until they overcome the resistance, and then—explosion. Thus also in volcanoes. The mountain may have been quiescent for ages, while the internal forces were accumulating, until at length they attained a magnitude such as to overcome all resistance, and then there comes an eruption; so that in the geyser and volcano we see clearly the same law of catastrophe illustrated.

This law is manifested also in the earthquake, often accompanied by the sudden elevation or depression of extensive regions.

Finally, to summarize, we see everywhere this law of catastrophe evidenced, in separation of planetary matters, in unconformability of strata, in the outpour of lava-beds and of trap-rocks, in the vast dykes traversing extensive mountain-chains, in the introduction of life on our globe, in the destruction of old and the introduction of new species of animals and plants, in geyser and volcanic action, in earthquakes with the sudden elevation or depression of more or less extensive regions, and in the natural death of each individual organism.

§ 11. Upon close examination it will be seen that in most of the instances of catastrophe noticed above there was certainly no breach of law, but that the catastrophe in each case arose from the regular working of law, as in the separation of the planetary masses, stratification, elevation of mountains, formation of dykes, outpour of lava-beds, geysers, volcanoes, earthquakes, and in the death of each individual organism; and we may well imagine (in fact, be sure) that in all the rest the working of natural law will be found, only under the guidance of a *force* that true science will be compelled to recognize in all nature, even the presence of the Supreme Will, clearly manifested, it seems to us, in that all these multitudinous changes were directed toward a complete *habitable world*—seen especially in the creation of matter; in the rotation given to the primeval nebulous mass; in such adjustments of the elements that the resulting atmosphere is perfectly adapted to both plant and animal life; in provision for such distribution of water through springs as is necessary to life, which necessitated supervision throughout all geologic changes; in the arrangement of the continental masses so promotive of civilization and human welfare, and in the direction and con-

trol of the development of living beings from species to species *per saltum*, as will appear further on. It must be noted, however, that reason cannot certainly deduce the immanence in nature of the ever-acting Supreme Will at all times from those phenomena that make the action of that will necessary to thought, since the infinite One may have so established the universal order that each catastrophe would certainly take place when needed in the evolution of the world of things.

§ 12. The truth above affirmed is curiously illustrated by the operation of Babbage's calculating machine as set forth in the ninth Bridgewater treatise. Thus: The machine was constituted of wheels, on the circumferences of which were engraved the natural numbers, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. Now the machine in motion presents to the eye the numbers successively, each exceeding its immediate predecessor by unity. "Now, reader," says Mr. Babbage, "let me ask you how long you will have counted before you are firmly convinced that the engine has been so adjusted that it will continue, while its motion is maintained, to produce the same series of natural numbers? Some minds are so constituted that after passing the first hundred terms they will be satisfied that they are acquainted with the law, after seeing five hundred terms few will doubt, and after seeing the fifty thousandth term the propensity to believe that the succeeding term will be fifty thousand and one will be almost irresistible. The term *will* be fifty thousand and one, and the same regular succession will continue, the five millionth and the fifty millionth term will still appear in their expected order, and one unbroken chain of natural numbers will pass before your eyes from *one* up to *one hundred millions*. True to the vast induction that has been made, the next succeeding term will be one hundred millions and one; but the next number presented by the rim of the wheel, instead of being one hundred millions and two, is one

hundred millions *ten thousand* and two, the whole series from the beginning being represented thus:

1
2
3
4
.
.
.
.
.
.
99,999,999
100,000,000
100,000,001
100,010,002
100,030,003
100,060,004
100,100,005
100,150,006
100,210,007
100,280,008
.....

The law which seemed to govern this series failed at the one hundred million and second term. This term is larger than we expected by 10,000, the next term is larger than we expected by 30,000, and the excess of each term above what we had expected forms the following table, 10,000, 30,000, 60,000, 100,000, 150,000, being, in fact, the series of triangular numbers* multiplied each by 10,000.

If we now continue to observe the numbers presented by

* Triangular numbers are formed by adding the successive terms of the series of natural numbers, thus:

$$1 = 1$$

$$1 + 2 = 3$$

$$1 + 2 + 3 = 6$$

$$1 + 2 + 3 + 4 = 10, \text{ etc. Called triangular numbers because a}$$

the wheel we shall find that for a hundred, or even for a thousand, terms they continue to follow the new law relating to the triangular numbers; but after watching them for 2,761 terms we find that this law fails in the 2,762d term.

If we continue to observe we shall discover another law then coming into action, which also is dependent, but in a different manner, on triangular numbers. This will continue through about 1,430 terms, when a new law is again introduced, which extends over about 950 terms, and this too, like its predecessors, fails and gives place to other laws, which appear at different intervals.

Now it must be observed that the law that each number presented by the engine is *greater by unity than the preceding number*, which law the observer had deduced from an induction of a hundred million instances, was not the true law that regulated its action, and that the occurrence of the number 100,010,002 at the 100,000,002d term was as necessary a consequence of the original adjustment, and might have been as fully foreknown at the commencement, as was the regular succession of any one of the intermediate numbers to its immediate antecedent.

The same remark may apply to the next apparent deviation from the new law, which was founded on an induction of 2,761 terms, and also to the succeeding law, with this limitation only: "That whilst their consecutive occurrence at various definite intervals is a necessary consequence of the mechanical structure of the engine, our knowledge of

number of points corresponding to any term can always be placed in the form of a triangle, thus:

| | | | | |
|---|----|-----|------|---------|
| 1 | 3 | 6 | 10 | 15 etc. |
| . | . | . | . | . |
| | .. | .. | .. | .. |
| | | ... | ... | ... |
| | | | | |
| | | | | |

analysis does not enable us to predict the periods themselves at which the more distant laws will be introduced."

We have given this curious matter at length for the purpose of illustrating that an apparent deviation from the observed sequence of things may result from our ignorance of the true law of sequence, so that, for aught we know, *evolution from species to species*, without Mr. Darwin's small variations, may have been the established law of living beings from the very beginning.

§ 13. Law of Luminiferous Ether. Having considered thus briefly the progress of the world's development, so far as effected by the known properties of matter, before proceeding further in our inquiry we pause to consider a substance, not of matter, the existence of which science has been compelled to recognize, although it is not in any way itself cognizable by our senses—viz., the luminiferous ether, a substance universally admitted by scientists to fill all space, certain vibrations of which so affect the visual organs of animals as to give the sensation of sight, certain other vibrations causing heat, others again giving the phenomena of electricity, with the accompanying phenomena of magnetism. The ether, then, is to be regarded as the source of the forces so effective in all the operations of nature. Yet ether itself is not cognizable by sense. No man ever saw a ray of light—itsself invisible, it simply *makes visible*. "Whatever makes visible, is light." (Paul.)

Now what is this strange substance—this ether? It is not matter *as we know matter*. So much seems certain. Matter is atomic; ether is non-atomic. Matter, whether in the solid, liquid, gaseous, or radiant state, is discontinuous—*i. e.*, there is space, *empty space*, so far as it is concerned, between its molecules; ether is continuous. Matter obeys the law of gravitation; ether does not, otherwise it could not be uniformly distributed through space. Matter is impenetrable to matter—that is, no two particles of matter

can occupy the same space at the same time; but matter does not exclude ether from the space *it* occupies. They are *vacua* to each other.

Ether, then, is not matter, not being subject to the laws of matter; yet it affects matter, acts upon matter, is essential to the very existence of all organisms, if not to the existence of matter itself. (See the following paragraphs.) Here, then, science is compelled to recognize the existence of a somewhat—it knows not what—intruding and forcing recognition of its presence *ab extra*, so far as the visible material universe is concerned.

It may be objected to the above reasoning that ether must be matter, since it is the bearer of force or energy to matter, and its vibrations set in vibration the molecules of all kinds of matter.

We take this conclusion to be a *non sequitur*, since science tells us nothing, absolutely nothing, of what matter *is*, or of its relation to ether. We are equally ignorant of the real nature of matter—of energy and of ether—and therefore cannot predicate of ether that *it is matter*, because it is the bearer of energy to matter. This assumption begs the whole question.

We sum up the reasoning briefly thus: All matter is subject to gravitation, and hence cannot remain uniformly distributed in space. Luminiferous ether is uniformly distributed in space; therefore, it does not obey the law of gravitation, and hence cannot be *matter*.

Further, if ether be matter it must offer resistance to planetary motion, and earth must be drawing nearer to the sun, and thus the length of our year be diminishing. We need hardly say that no such diminution has been detected, even to the fraction of a second, within the historic era.

And again, if ether be matter the length of our day must be increasing from the same cause—resistance to

rotation from friction—but no such increase has been detected.

§ 14. *Life, Origin of.* The introduction of life upon our earth has been the great puzzle to scientists. There certainly was a time when there was no life upon our globe. Then life appeared. The *how*, the *what*, the *whence*, have been the great questions. The most prominent scientists, habitually referring all phenomena to the forces of nature, working in regular sequence under the laws of matter, admit of no explanation outside of the realm of matter and material forces. Did life, then, originate in the realm of matter? Can it be accounted for by the interaction of material atoms under the operation of known molecular and chemic forces?

The question has been extensively submitted to the test of experiments. One party answered the above questions affirmatively, embracing the doctrine known as abiogenesis, appealing to the results of hundreds of experiments by different observers as proofs of abiogenesis. Another party answered the questions negatively, appealing also to the results of *their* experiments, which seemed to prove that *life* comes only from antecedent life, or the truth of the doctrine known as biogenesis.

It is not our purpose to discuss the question at any length. Suffice it to say that the advocates of biogenesis have been triumphant all along the line, and that *now* no true scientist will affirm the truth of abiogenesis. Huxley and Tyndall, the leading scientists of the age, declare that there is no scintilla of evidence that in *our day* life has been produced where there were no germs of antecedent life; yet strangely enough they think, or seem to think, that in primordial days matter *may* have been in such a state as to produce life spontaneously. Upon this we simply remark, if that be so, the elements have changed their nature during the progress of the ages, and the Hydrogen,

Oxygen, Nitrogen, and Carbon (the chief elements of the organic cell) of *primeval time* were not the same elements that we *now* find them; and what becomes of the regular unvarying sequence of things and the orderly working of nature?

Discussing this question, the authors of the "Unseen Universe" say (pp. 229, 230) that "dead matter cannot produce a living organism is the universal experience of the most eminent physiologists—in fact, the law of biogenesis is justly regarded by Prof. Huxley and others as the great principle underlying all the phenomena of organized existence."

Prof. Roscoe, again, approaching the subject from the chemical point of view, says, speaking of red blood corpuscles: "We have not been able, and the evidence at present rather goes to show that there is not much hope of our being able, to construct these granules artificially; and the case is in this position, that, so far as science has progressed at present, we have not been able to obtain any organism without the intervention of some sort of pre-existing germ." "If we assume the truth of this principle it appears to lead us directly to infer that life is not merely a species of energy, or a phenomenon of matter."

We take it, then, as settled in science that life comes only from antecedent life, and that it is incompetent for the forces of nature to produce life. These forces are all correlated to each other, while none of them are correlated with life. Thus light and heat produce electricity, and again electricity produces heat and light. Electricity produces magnetism, and again magnetism generates electricity; again chemism produces electricity and heat, and these again generate electricity.

Then we see that these chief forces of nature are interchangeable—may be converted into each other, and to an unlimited extent—while neither of them is correlated with life. Life, then, does not stand in the circle of these forces;

they are transmutable. All energy is transmutable—*life* is not transmutable; therefore *life* is not an energy, but is far more, it is an *entity*, as we shall see more fully further on.

§ 15. This result, it seems to us, might have been deduced by *a priori* reasoning. Thus: The organic cell of which all organisms are built up is composed of atoms of Oxygen, Hydrogen, Nitrogen, and Carbon. These several elements have their natural affinities for each other, according to the well-known laws of chemistry, and in combining with each other, in whatever ratios, always obey those laws. Now nothing is more certain than that the organic cell is such an unstable compound that its elements are only held together by the presence of life; bereft of this it at once begins to dissolve into its elements. Now it may well be asked, What is it that holds in abeyance the natural chemical affinities of the several elements, and compels them, despite those affinities, to unite to form the cell? We take it that only one answer can be given to this question—viz., the *life force*. We call life a force, though we hold it to be an *entity* exerting a force peculiar to itself.

Again, an unstable equilibrium can only be maintained by a force external to itself; but the organic cell is an unstable equilibrium, and when the life is withdrawn, the cell, and the entire structure of which it forms a part, speedily falls to pieces, decomposes, is resolved into its element, the presence of life being necessary to the maintenance of the equilibrium. It would seem therefore impossible that the equilibrium should have been attained without the constructory presence of life, since that would be making the result a cause of itself manifestly absurd.

On this subject the authors of the "Unseen Universe" say (p. 186): "The body owes its delicacy to its chemically unstable nature; to a peculiar collection of particles, which certainly would not, by virtue of their own mere physical forces, have united themselves together as we find them in

the body.” The *life*, then, is the *builder* of the organism, and not a function of it—*i. e.*, proceeding from, and due to, the organism. “The builder of the house is greater than it.” (Paul.) We will return to this subject further on.

§ 16. Some scientists, aware of this difficulty, and averse to admitting the introduction into nature of any force from without the material universe, ignoring the presence of the ethereal forces, which, as we have seen, are from without the material universe, have suggested that the life-germ may have been brought to earth from some other world by some stray meteor. With regard to this hypothesis, we remark that it only puts back one step the introduction of life into the material universe. And again, we remark that the living germ is destroyed by a temperature but little above that of boiling water, as also by intense cold, and that a meteor coming from the interstellar spaces must have been long exposed to a temperature near the absolute zero—273° centigrade—and that meteors passing through our atmosphere with their planetary velocities are always heated to incandescence, a temperature far above that needed to destroy life. Thus are we driven to the conclusion that life was introduced into our world by that “*force that makes for righteousness*,” and if this be admitted, then it also must be admitted that *that* force is *living*, and hence *personal*—even the *Supreme Will*; and here we hazard the opinion that, as scientists have been compelled by observation of the forces ever recognized around them to admit the existence of a substance in nature not subject to the law of matter, present always and everywhere (ether), so in the near future will true science recognize the presence of the Supreme Will in nature and above nature, manifesting himself by phenomena patent to every consciousness. So far as to the *whence* of life.

§ 17. We now proceed to consider the *nature* of this *life*, the origin of which we have been considering: What is it in itself? Is it an *entity*—a somewhat entering into dead

matter from without, lifting it into the world of organisms, and thus presenting to us the phenomena of the living, self-moving thing? or is it merely a function of the organism, having no existence of itself, being merely a phenomenon of peculiarly combined elementary substances, Hydrogen, Oxygen, Nitrogen, Carbon, combined in an eminently unstable equilibrium, maintained in equilibrium by the structure thus built up, an unstable equilibrium made tolerably stable by its own effects? This appears to us contrary to all reason—in fact, absurd. The laws of thought seem to us not to permit such conclusions. Yet this is the conclusion of Mr. Herbert Spencer. If we understand him, his whole system of biology is based upon the conception that life is simply a function of the organism, and *nothing more*. We here remark only that upon this theory all living beings are machines, and can only act, move, think, and reason as the molecules of their structure move among themselves—a theory that antagonizes the individual consciousness of every man and woman in the world.

Mr. Spencer defines life, on the basis of his theory, to be “the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external co-existences and sequences;” or, “the continuous adjustment of internal relations to external relations.” (“Principles of Biology,” pp. 74, 80.)

Now this definition tells us very clearly of the phenomena of life—what it *does*—but it does not even attempt to give us an idea of its *nature*. And we here remark that if *life* be merely a *function* of the organism—nothing more—there would seem nothing more to be said as to its essential nature.

Further on we shall find much more to be said of its nature, as deduced from the phenomena it presents to us. For the present, and from our stand-point, we define life to be an *entity that from merely material substance builds up an or-*

ganism, assimilating to its structure dead matter, and producing growth and reproduction; and we hope to show, further on, that this view of life is much more accordant with the phenomena presented continuously by all living beings.

§ 18. If we understand Mr. Spencer's theory, as set forth at length in his "Biology," it is that vibrations are caused by the proper stimulants among the molecules of the nerves of sense (peculiar to each organ), and by them transmitted to the brain, whose molecules are thus set in vibration, and the results of these vibrations of the brain-matter are sensations, perceptions, thoughts, etc. Thus the vibrations of ether, falling upon the retina, set up corresponding vibrations in the optic nerve, terminating in a peculiar vibration of the brain molecules, which gives the sensation of sight; or, rather, we should say, on the basis of this theory, *is* the sensation or perception of *sight*. And so of the auditory nerves, set in motion by the vibrations of the atmosphere, or other substances capable of causing such vibrations; and so of all the organs of sense.

Now, if this be true, it would seem that whenever the vibrations of any nerve of sense are sent to the brain, that sense must be called consciously into exercise. Thus, whenever the vibrations of ether cause vibrations in the retina, the person *must see* (have conscious perception of sight), and so of the rest; but this is well known not to be the fact. Something else is necessary to conscious perception—viz., *attention*. How often does it happen that with eyes wide open one *does not see*? We say *does not see*, because we maintain that a consciousness of the thing seen is essential to sight; and, in fact, all the senses are appealed to, without *cognition of sensation*. It is common in battle for the combatant to receive deadly wounds without being aware of the fact, because the *attention* was absorbed in other directions.*

* If life be merely a function of structured matter and *mind*—the result of vibration of the molecules of the brain—then mind, being

Besides, what is known as *unconscious cerebration** is recognized as a fact by all scientists, and it is well known that by it difficult equations have been worked out and problems solved, to the solution of which the person had been incompetent when his attention was directed to the investigation. Now all this seems to us utterly antagonistic to the theory that *mind* is the result of vibration of the molecules of the brain. *It is that, and it must be much more than that.*

And again, if Mr. Spencer's theory be true it would seem that the sensation of sight, of hearing, of smell, of taste would be impossible, unless the appropriate nerve of each organ of sense were directly affected by its appropriate correspondent from without. And if it happen in any case, or by any means, that one or more of these sensations can be produced without any such action upon the nerve set apart in nature for the production of such sensation, then it appears to us that Mr. Spencer's entire theory must be abandoned as contradicted by the facts of nature; for this is pre-eminently an age of experiment, and when an appeal can be made to experiment, the result, where clearly manifest, must settle the question, must be an end of all discussion.

§ 19. An Experiment. Fifty years ago, as the author very well remembers, there was much discussion throughout the civilized world of what is known as mesmerism, and although it appears to have been ignored by scientists, or looked upon with contempt, some of its phenomena were of very great interest, as bearing upon the point now under

simply and solely a phenomenon of these vibrations, *must* with its phenomena result from them, and hence cognition always accompanies sensation.

* Unconscious cerebration proves that *mind* under certain conditions may *reason* and draw conclusions unconsciously—even more effectively—when free from the distractions that accompany conscious reasoning.

discussion; since the mesmerized subject, when *en rapport* with the mesmerizer, frequently, if not always, was proven to possess the same sensations, of whatever kind, as the mesmerizer.

As an illustration, the author, at that time (1838) a professor in Allegheny College, Pa., being desirous of arriving at some certainty in regard to the alleged phenomena, and distrusting the exhibitions made by traveling lecturers, determined to try the experiments for himself. Accordingly he arranged with Darwin A. Finney, a member of the senior class of that year, to come to his dwelling at 3 o'clock on a certain day, prepared to try experiments; and this is what occurred:

Seating his wife upon a rocking-chair in a common sitting-room, with her back to a window which opened upon an alley (in Meadville, Pa.), he made a few passes with his hands as he had seen lecturers do, and in less than a minute, observing her eyes to have a hazy appearance, he closed them, and called Finney into the room, and seating himself before his wife, touched *with the end of his middle finger the corresponding finger of one of her hands*. Finney came behind him, and reaching over his shoulder put into his mouth a piece of tobacco not larger than a pea (the author did not use tobacco). His wife immediately showed signs of disgust, saying: "O don't! O don't!" "Don't what?" "Why, you are putting tobacco in my mouth," was the reply. The tobacco was at once ejected. Finney then in the same way put a small piece of loaf-sugar into the author's mouth, when his wife immediately began to smack her lips, saying, "That is good." "What is good?" "It's loaf-sugar, but it tastes a little like tobacco." Finney then placed under the writer's nose a small smelling-bottle full of aqua ammonia, and removed his thumb, allowing the penetrating vapor to enter his nostrils. Immediately his wife threw out her hands, leaned forward, and exclaimed,

“O don’t!” “Don’t what?” was asked. “You are pouring hartshorn on me,” was the answer. Finney then, going behind the author’s wife, took from a shelf a box of sedlitz powders, and held it up, when the author said, “Julia, what is that?” and received the answer, “It’s a law-book.” (A failure—mark the sequel.) The author then, desiring to test clairvoyance, said to Finney: “Go tell Tom to hide.” (Tom was a negro boy living with the family.) Luckily for our experiment, Tom went into the alley, and took his place behind a plank fence, by the alley gate, so that the author, looking over his wife’s head through the window, could plainly see his head and shoulders above the fence. The author then said: “Julia, I want Tom; call him.” “O there he is; you see him,” was the answer. “Where?” “There by the gate.” “Which gate?” “Why, there by the alley gate; you see him.”

Being entirely convinced in general, and yet puzzled by the matter of the box of sedlitz powders, the author sent Finney out of the room, and aroused his wife by quickly throwing up his hands several times before her face, and immediately left the room. After perhaps five minutes he and Finney returned to the room and found his wife lying on the sofa asleep. On being awakened she seemed much confused, and made many apologies for being found asleep; and being desirous of ascertaining if she had any recollection of what had passed the author asked her if she had dreamed any in her sleep. At first she said: “No!” and then, after a pause, said: “Yes, I did. I dreamed that I saw a box of sedlitz powders, and it looked so curious—S-e-d-l-i-t-z.” “And what did you call it?” was asked; and the reply was: “A law-book.” And after a pause, she added: “And *I dreamed that I saw Tom, and he looked so curious. I couldn’t see any thing but his head and shoulders; his body seemed covered by a cloud.*” (The author could only see his head and shoulders above the fence.)

Now the facts. Here was an experiment. Was it, or was it not, conclusive? She (the subject) clearly received identically the same sensations as the author. *He* by the usual organs; *she* through the nerves from the ends of her fingers. Either those nerves carried to the brain the same messages as the nerves of the several special senses, or else we must conceive the bodies of both mesmerizer and subject to be surrounded by a mental *aura* which is brought *en rapport*. And in either case what becomes of the theory of Mr. Spencer, that the mind is solely a function of structured matter? The author appeals to experiment. Let any one who receives the theory of Mr. Spencer as accounting for the phenomena of life, submit the question to experiment, and he may settle it finally. The author is too familiar with men to hope that *his* experiment will have any weight with the scientific world, and has cited the facts simply as pointing out to others how *they* may settle the question.

And again, it is a well-established fact that some persons possess a faculty that enables them to cognize the *thoughts* of others when brought into contact with them, and are hence called mind-readers. Now it appears to us that if this be admitted in the case of a single individual, it directly antagonizes the theory that mind is a result of *structured matter*, and goes strongly to prove the truth of the author's hypothesis of a *mental aura* as the habitat of mind in man. It must, however, be admitted that the whole subject is shrouded in mystery. There is much about it, as there is about all else of nature, that we cannot understand; but it does seem impossible that Mr. Spencer's molecular theory should be true, the facts manifestly bearing witness against it.

§ 20. To our mind the facts recited seem to render it probable (we suggest it as an hypothesis) that the mind has a somewhat—call it a mental *aura*—pervading, permeating, and perhaps enveloping the entire organism, but hav-

ing its head-quarters in the brain-matter, with which it is somehow (we may never *know* how) intimately connected; that when this mental *aura* is affected, it matters not how, just as it is affected by, say the message sent along the optic nerve by the vibrations of ether called light, it refers the impression (from habit) to the same source from which it has been accustomed to receive similar impressions, and sight is the result.

It may be asked that if the impression upon the organ of sense be not carried to the sensorium in the brain by a motion of the molecules of the nerve, how is it carried thither? Before replying to this question, we ask how is the message sent along the wire of the electric telegraph, for perhaps thousands of miles, with a velocity of say 288,000 miles per second? Certainly not by a motion of the molecules of the conducting wire, but by the tension of the electric fluid (whatever that may be). Just so the message is sent from the extremity of the nerve by the tension of that fluid or *aura* that we have supposed to pervade the nervous system, which fluid, if it be not electricity, is certainly closely correlated therewith.

We point out that the slowness of transmission along the nerve does not prove that the nervous fluid is essentially different from electricity, since the velocity of transmission of the electric fluid depends upon the conductivity of the wire, the poorer conductors retarding the transmission. Besides, it should be remembered that *electricity*, passed along the nerve, effects muscular contraction precisely as the message sent by the *will* does. And if it be further objected that this view of the electrical force being under the control of mind controvenes the law of the conservation of energy, the reply is simple. That abundant provision is made in the organism for the generation of electricity by the chemical combinations and decompositions therein, and it will not seem incredible that provision should be made for

storing up this electricity for the mind's use, when we recollect that precisely this provision is seen in the electric eel, the gymnotus. Besides, the same objection lies in any case, since the mind does undoubtedly possess the power of setting forces in motion through the medium of the nervous system.

We have given our views as above with the impression that Mr. Spencer's theory makes the mind, the life, simply and solely a *function of structured matter*; yet it would seem that Mr. Spencer himself is not satisfied with that view as entirely satisfactory, for he says ("Principles of Psychology," Vol. I., p. 159): "Mind, as known to the possessor of it, is a circumscribed aggregate of activities; and the cohesion of these activities one with another, throughout the aggregate, compels the postulation of a something of which they are the activities." These words seem to recognize in *mind*, and hence in *life*, a somewhat beyond the function of structured matter. This somewhat is the *entity* which we have predicated of life.

§ 21. Finally, in this connection, we perceive the life to be, not a function or effect of the organism, but the architect thereof, as said before—an entity connected with and residing in a *house* itself has built, and which it keeps in repair by assimilation of material taken from without, thus providing for replacing waste material and for growth. We consider this life to be connected with the organism by what we have called the mental *aura* (perhaps a segregated portion of ether), by which it is able to control the movements of its house. And, until more fully informed on the subject, this mental *aura* may perhaps be considered as the soul's *habitat*, identical with, or allied with, the spiritual body which Paul, more than eighteen centuries ago, declared that men possess, telling us "that if our earthly house [the body] of this tabernacle were dissolved, we *have* [not will have] a building of God, a house not made with hands [not material], eternal in the heavens."

§ 22. Nature of Life continued. Before proceeding further in our investigation, we propose to consider somewhat at length, as being in the purview of our line of thought, the nature of life under the aspect of it presented by Mr. Spencer in his "Principles of Biology." Mr. Spencer writes as follows ("Biology," p. 74): "Our conception of life becomes the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external co-existence and sequences." And on page 80 he says: "The broadest and most complete definition of life will be the continuous adjustment of internal relations to external relations." And in illustration he says: "The actions going on in a plant presuppose a surrounding medium, containing at least carbonic acid and water, together with a supply of light and a certain temperature. Within the leaves Carbon is being assimilated and Oxygen given off; without them is the gas from which the Carbon is being abstracted, and the imponderable agents that aid the abstraction. Be the nature of the process what it may, it is clear that there are external elements prone to undergo special re-arrangements under special conditions. It is clear that the plant in sunshine presents these conditions, and so effects these re-arrangements; and thus it is clear that the changes that constitute the plant's life are in correspondence with co-existence in its environment." And so in every living being.

We simply take occasion to remark that the changes Mr. Spencer speaks of clearly *do not constitute* the plant's life, but *are simply phenomena indicating the presence of that life.*

Mr. Spencer, in his 6th chapter, page 82, says: "The degree of life varies as the degree of correspondence." "Allowing a margin for perturbations, the life will continue only while the correspondence continues; the completeness of this life will be proportionate to the completeness of the correspondence, and the life will be perfect only when the correspondence is perfect." Again (page 88) he says: "As afford-

ing the simplest and most conclusive proof that the degree of life varies as the degree of correspondence, it remains to point out that perfect correspondence would be perfect life were there no changes in the environment, but such as the organism had adapted changes to meet; and, were it never to fail in the efficiency with which it met them, there would be *eternal existence and universal knowledge.*" (Italics ours.)

§ 23. Following the line of thought thus clearly indicated by Mr. Spencer, we perceive that where there are no correspondences, no adjustments of internal relations to external relations, there is, *there can be*, no life. This is death. Thus in the mineral, as the crystal, there being no correspondence whatever between internal and external relations, there is death—the mineral is dead, a mere thing. And in the plant, the correspondences having only relation to the vegetal life, the plant is dead to the higher, the animal life. Thus also in the animal, the correspondences being solely between the internal and the things in the external visible environment—that is, the adjustment of internal relations to relations in the material universe surrounding it—the animal is, *must be*, forever dead to the higher life in the domain of the spiritual. And in general the living organism of each kingdom is, and must remain, dead to the life of the kingdom above it.

These principles might be indefinitely illustrated by reference to individual existences in each of the kingdoms of living beings; but they are so self-evident that no further illustration of them is needed.

CHAPTER III.

§ 24. Having considered the origin of life upon the earth, and somewhat of its nature, thus briefly, and given in part our reasons (we will resume the subject further on) for viewing life as an *entity*, and not as a mere function of organized matter, we proceed to examine, as briefly as may be consistent with clearness, the progress of the development of living beings, as witnessed to us by the records.

Fortunately we have recorded in unmistakable characters in the strata of the earth's crust the history of this development, both in the vegetable and in the animal kingdom, the fauna and the flora of each successive period having left their remains securely treasured up in the rocks, awaiting the eager study of the scientific explorer, the results of the exploration constituting what may now at length be reasonably termed the *science* of geology.

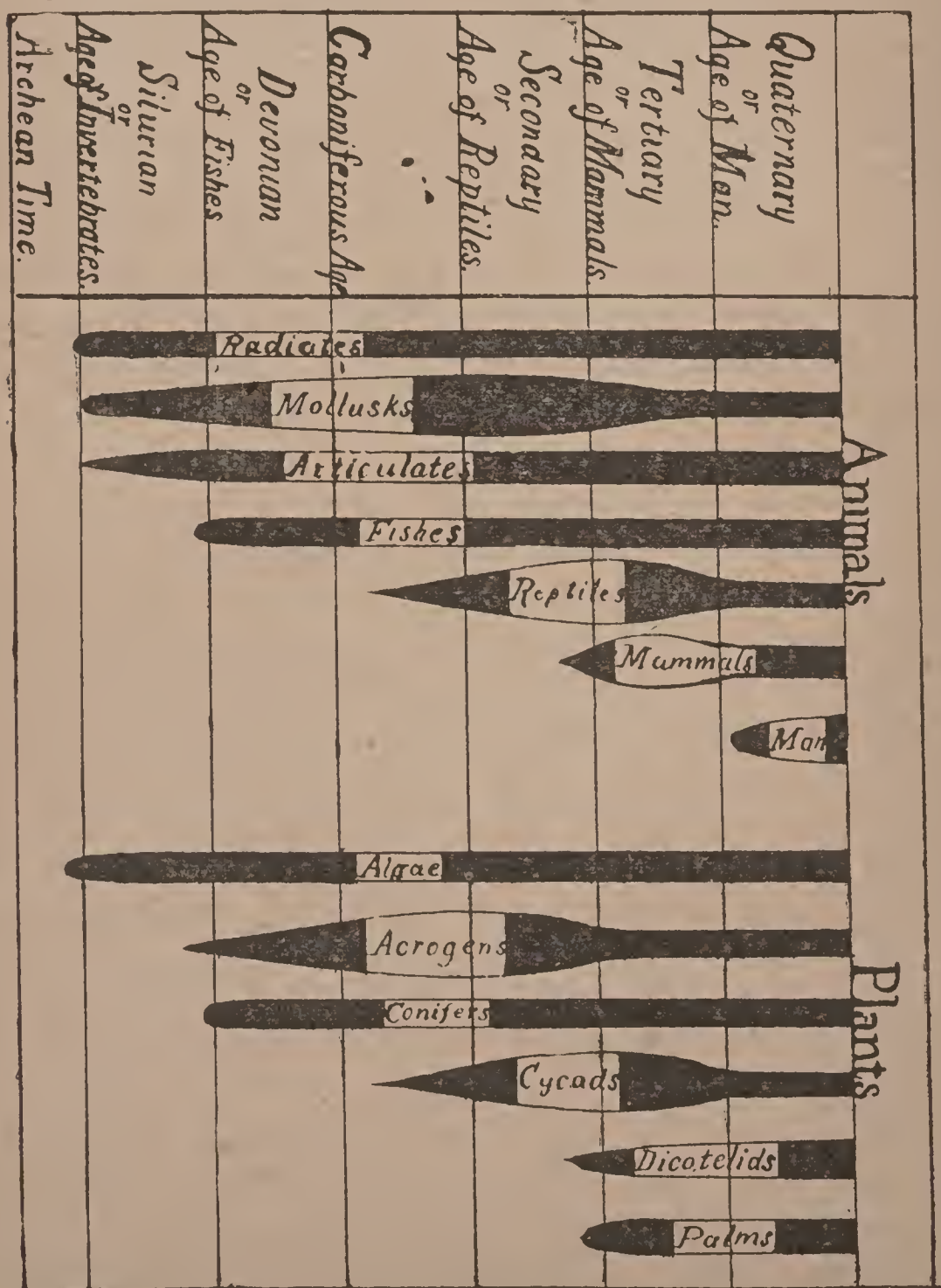
Our limits will not permit us more than a very brief and perhaps imperfect exhibit of the laws of this development, nor is it consistent with the general purpose of this work to do more than this.

These laws may be briefly included under the following heads—viz.: (1) From the simple to the complex; (2) ever-increasing specialization; (3) assimilation, waste, growth, reproduction; (4) *generally*—not always—from the lower to the higher organisms; (5) from *species* to *species*, *without intermediate links*.

The first plants that appeared were sea-weeds, and the first animals probably the systemless protozoans, which consisted of a simple sack inclosing a structureless jelly, without organs of sense, absorbing oxygen through the inclosing sack,

which also served for a stomach, which was improvised, surrounding and inclosing such particles of food as came in contact with it.

§ 25. From this low beginning the progress was *generally*—not *always*—upward, to higher and higher orders, in both the vegetable and animal kingdoms. The following table may exhibit this in a general way:



From an inspection of this table it will be seen that the radiates, mollusks, and articulates began with the silurian; fishes, at the close of the silurian; reptiles, at the beginning of the carboniferous age, culminating during the secondary and tertiary; mammals toward the close of the secondary, and culminating during the tertiary; and man at the beginning of the quaternary age.

And that the same law of progress is seen among plants: *Algæ* beginning with the silurian, and perhaps earlier; acrogens and conifers toward the close of the silurian, the former culminating during the carboniferous and secondary ages. *Cycas* began early in the carboniferous, and culminated during the secondary and tertiary ages. Dicotyledonous plants and palms began toward the close of the secondary age. Mr. Dana says: "Life commenced among plants in sea-weeds, and it ended in palms, oaks, elms, the orange, rose, etc. It commenced among animals in *lingulæ* (mollusks standing on a stem like a plant), crinoids, worms, and trilobites, and probably earlier in the simple systemless protozoans; it ended in man. Sea-weeds were followed by lycopods, ferns, and other flowerless plants, and by gymnosperms, the lowest of the flowering plants; these, finally, by the higher flowering species above mentioned. The palms and angiosperms, radiates, mollusks, and articulates, which appeared in the earlier silurian, afterward had fishes associated with them; later, reptiles; later, birds and inferior mammals; later, higher mammals, as beasts of prey and cattle; lastly, man."

Thus we see that both in the vegetal and animal kingdoms the *general* progress was upward, but we shall see that there are notable exceptions to this law. We quote from Dana: "Progress not always began by the introduction of the lowest species of a group. Mosses, although inferior to lycopods and ferns, appear to have been of later introduction, for no remains have been found in the carbonifer-

ous or devonian rocks, although there are relics of both of the other tribes of plants. The earliest of fishes, instead of being of the lowest grade, were of the highest; they were ganoids or reptilian fishes. Trilobites found in the first fauna of the silurian are not the lowest of crustaceans. No fossil snakes have been found below the cenozoic, although large reptiles abounded in the mesozoic. Oxen date from the later tertiary, long after the appearance of many higher mammals—as tigers, dogs, monkeys, etc.”

§ 26. Be it noted, also, that all along in the ages we find in the living species a prophecy of what is yet to come—viz., what are called *comprehensive types*. Thus, for example, ganoid fishes comprehend in their structure some reptilian characters. The earliest mammals were marsupials, embracing in their structure some characteristics of oviparous vertebrates, and were thus intermediate between them and true placental mammals. And this fact of comprehensive types is found exemplified all along in every geological era.

Thus, in studying the organisms of the successive ages, we see always and everywhere a progress as stated above: (1) From the simple to the complex; (2) ever-increasing specialization; and (3) in every living thing the law of assimilation, waste, growth, and reproduction for the perpetuation of the species.

The question now recurs, How was the development carried on? Was it by the potency of forces resident in nature? Have natural forces alone been at work, from first to last, all along the many lines of development?

§ 27. Very many, perhaps the majority, of the scientists of the day answer these latter questions in the affirmative, adopting the Darwinian hypothesis of *evolution*—that by slight variations in species, during the long geological ages, the successive variations being confirmed and perpetuated, new species were successively evolved progressively, under

certain laws, not necessary to be stated here, and that thus we may account for the innumerable species of organisms that live or have ever lived, from the *fucoi* and protozoans up to the highest phenogams of the vegetal kingdom, and to man, at the head of the animal kingdom.

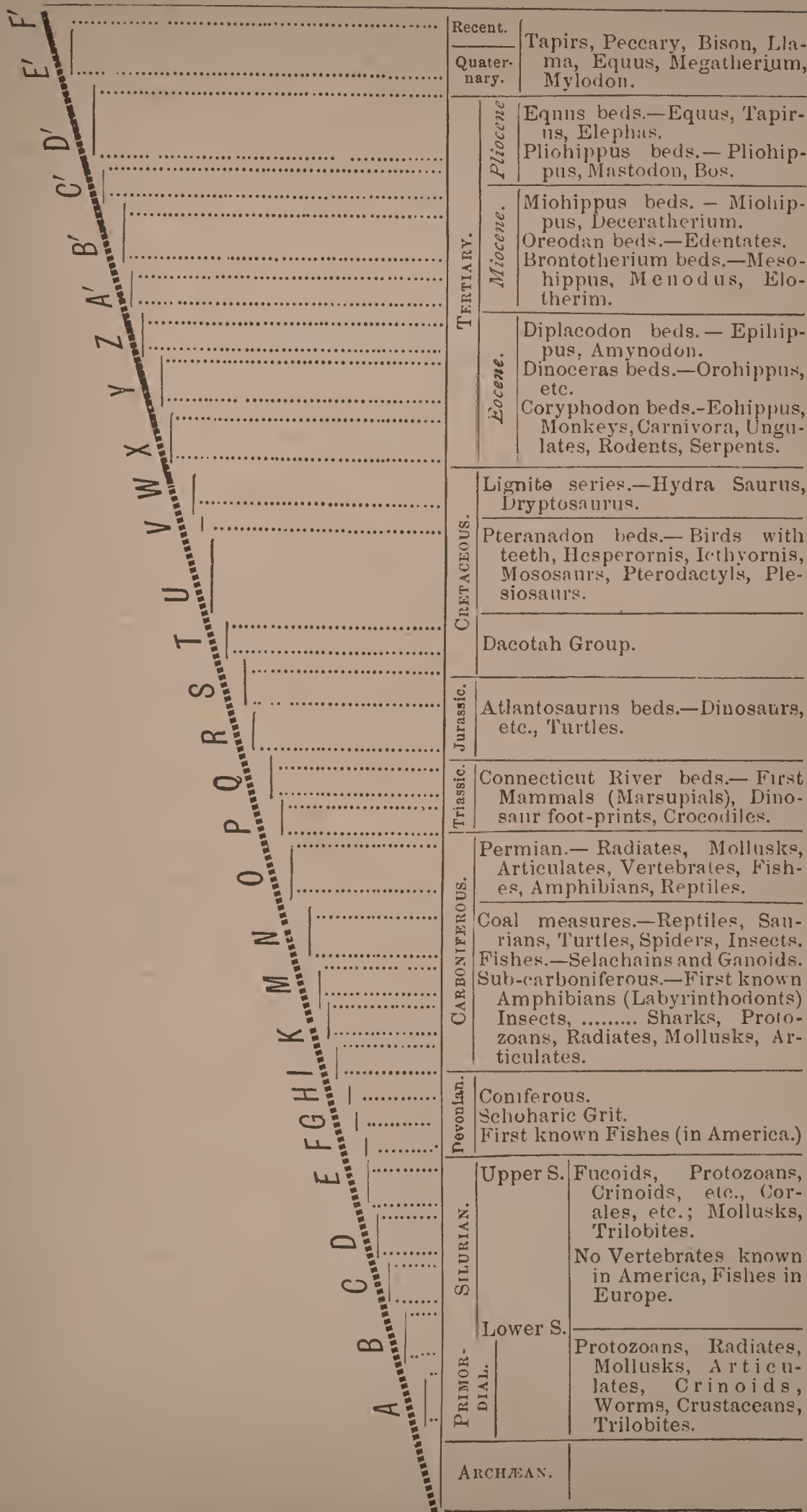
And it must be confessed that this beautiful theory appears to our reason to be fully adequate to the result, except as to man. The only question is, Is it true? is it confirmed by the records? Fortunately, the records of the development of living things on our globe are accessible to us, and, possessing authority to speak, their testimony must be received as conclusive as to matters of fact. We need hardly say that these records are found in the rocks—written in the fossils with which the rocks so abound.

Now we point out that, on the hypothesis of small variations, progressing along certain lines until specific differences were attained, the rocks ought to record the fact, and *specific lines should disappear*. It should be impossible even to draw specific lines, they being quite obliterated by the gradual passage from one species to another, and this along whatever lines the evolution should proceed.

§ 28. We need hardly say that the rocks bear distinct, direct testimony adverse to this evolution hypothesis—not here and there in certain strata only; but everywhere, throughout all the ages, the *specific differences in fossils are even more distinct, more clearly defined in the fossils of every era than in the living fauna and flora*. To this fact geologic science bears direct and unequivocal testimony, as illustrated by the following plate:

We present to the reader on the opposite page an ideal section of the earth's crust, representing the various formations as determined by geologists, with some of the classes, tribes, and genera of animals that made their appearance on the earth in each of the several ages, so that the reader can see at a glance somewhat of the progress of life on the globe. We have represented in the dotted line A F,' ascending toward the right, the evolution conceived by scientists to have taken place from the protozoan to man.

The letters A, B, C, D, etc., represent species in ascending grade, the full short lines from the several letters toward the right represent the continuance of the species, and the dotted lines connecting these specific lines with the ideal crust show where in the crust each species will make its record. The several dots in the ascending line will represent the progress by gradual change from species to species, according to the Darwinian scheme of evolution. According to this hypothesis, let it be noted, there must have been innumerable links between any two species, and these intermediate links should be found in the rocks along with the distinct species. *But they are not found.* The inference is inevitable—they did not exist. Besides, the reader will see that this gradual rise obliterates specific lines; there should be none in the fossils of the rocks, while in fact specific lines are more clearly drawn in the fossil world than in the existing fauna and flora.



The fossils found in the rocks prove that development was ever *per saltum* (by leaps), old species disappearing and new species appearing in every formation, more or less completely. It seems to have been almost a *law* that the fauna and flora of each era were destroyed at its close, and a new fauna and new flora introduced.*

To this conclusion it may be objected that the links between species may have existed in the period transpiring between the destruction of the organisms of one era and the beginning of the new era, but it must not be lost sight of that this period was always brief when compared to the long time transpiring during the deposition of the sedimentary strata of any one formation; and the hypothesis is, therefore, inconsistent with the Darwinian theory of evolution. It may again be urged that only a small part of the rocks have been examined, and that we cannot certainly conclude what a more complete examination of the earth's crust may disclose on this point. This objection appears, it must be confessed, to be well taken; still it cannot be denied that the testimony of the rocks, as far as it goes, is unequivocally opposed to Mr. Darwin's theory of the origin of species. It may be further observed that the homologous parts, found so generally among all animated beings, only prove that, *however developed*, there was,

*Le Conte says in his "Compend," page 110: "But in *specific character* there is no such gradual passage of one species into another—no evidence of transmutation of one species into another, nor of deviation of one species from another. From this point of view species seem to come in at once in full perfection, remain substantially unchanged throughout their ranges, and pass out at once on the other border, other species taking their places as if by substitution, not transmutation. It is as if each species originated, no matter how, somewhere in the region where we find them, and then spread in all directions, as far as physical conditions and struggle with other species would allow."

from the beginning, always *system*, observed by the developing power or *force*, if you will.

We quote from Dana's Text-book, page 382, on this subject: "*Progress was connected with constant change of species, new species appearing as others disappeared.* No species of animal survived from the beginning of life on the globe to the present time, nor even through a single one of the geologic ages; and but few lived on from the beginning of any one of the many periods to its close, or from one period into another. There were wide-spread extirpations, closing the periods on each of the continents, and others, still less general, at intermediate epochs; and often some disappearances accompanied each change in the rock-depositions that were in progress; for in passing from one bed to another above some fossils fail that occur below, and from the strata of one epoch to another still larger proportions disappear, and sometimes with the transitions to rocks of another period or age very nearly all the species are different.

"Of all *genera* of animals now having living species, only one, the molluscan, genus *discina*, had species also in the earliest silurian; unless the *lingulellæ*, of the primordial, were, as formerly supposed, true *lingulæ*. Every other genus of that early time sooner or later numbered only extinct species; afterward, in the lower silurian, *nautilus* and a few others were added to *discina*.

"Such unbroken lines prove the oneness of plan or system throughout geological history. Nearly one thousand five hundred species of trilobites have been found in the paleozoic rocks, and in later formations *none*. Over one thousand species of the Ammonite group occur in the mesozoic rocks—the last there, or in the early tertiary, disappeared. Five hundred species of the nautilus tribe have been in existence; now there are but two or three. Over one thousand species of ganoids have been found

fossil; the tribe is now nearly extinct. The remains of two thousand five hundred species of plants, and over forty thousand species of animals, have been found in the rocks, not one of which is now in existence. Thus the old has been ever passing away."

Forty thousand species of animal remains among fossils! and yet not a single link between these species! So much for Mr. Darwin's theory of slight variations from species to species.

CHAPTER IV.

§ 29. **Conformity to Type.** The living germ of any animal or plant, when developing, always proceeds along a fixed line to produce an individual of the species of the animal or plant from which the germ was derived, and no other. An acorn never produces a chestnut-tree, nor a chestnut an oak; and so of all organisms. This heredity is called the *law of conformity to type*.

We cannot present this law more clearly than is done by Mr. Spencer, from whose work on "Biology" we quote (page 138). After describing the progress in development of a plant from its germ, Mr. Spencer continues: "The arm of a man makes its first appearance in as simple a way as does the shoot of a plant." According to Bischoff it buds out from the side of the embryo as a little tongue-shaped projection, presenting no differences of parts; and it might serve for the rudiment of some one of the various other organs that also arise as buds. Continuing to lengthen, it presently becomes somewhat enlarged at its end, and is then described as a pedicle bearing a flattened, round-edged lump. This lump is the representation of the future hand, and the pedicle of the future arm. By and by, at the edges of this flattened lump, there appear four clefts, dividing from each other the buds of the future fingers, and the hand as a whole grows a little more distinguishable from the arm. Up to this time the pedicle has remained one continuous piece, but it now begins to show a bend in its center, which indicates the division into arm and forearm. The distinctions, thus rudely indicated, gradually increase; the

fingers elongate and become pointed, and the proportions of all the parts, originally very unlike those of the complete link, slowly approximate to them. During this bud-like stage the rudimentary arm is nothing but a homogeneous mass of simple cells without any arrangement. By the divers changes they gradually undergo these cells are transformed into bones, muscles, blood-vessels, and nerves. The extreme softness and delicacy of this primary cellular tissue renders it difficult to trace the initial stages of these differentiations. In consequence of the color of their contents, the blood-vessels are the first parts to become visible. Afterward the cartilagenous parts, which are the basis of the future bones, become marked out by the denser aggregation of their constituent cells, and the production between these of a hyaline substance, which unites them into a translucent mass. When first perceptible the muscles are gelatinous, pale-yellowish, transparent, and indistinguishable from their tendons. The various other tissues of which the arm consists, beginning with very faintly marked differences, become day by day more definite in their outlines and appearances. In like manner the units composing these tissues severally assume increasingly specific characters. The fibers of muscle, at first made visible in the midst of their gelatinous matrix only by immersion in alcohol, grow more numerous and distinct; and by and by they begin to exhibit transverse stripes. The bone-cells put on by degrees their curious structure of branching canals; and so in their respective ways, with the units of the skin and the rest. Thus in each of the organic kingdoms we see this change from an incoherent and indefinite homogeneity to a coherent and definite heterogeneity illustrated in a quadruple way."

§ 30. No fact in nature is better known than this law of conformity to type: The germ of any organism whatever, under proper conditions, will always develop into an indi-

vidual of the species from which it proceeds. There must therefore be as wide a difference between the germs as there is between the species—between the living germ of the acorn and of the elephant as between the oak and the elephant. Now, wherein this difference? Is it in the *matter* of the germ, or in its *life*? If it be in the matter that the directive force resides, it would seem that it must consist in the structure of the molecules, and that infinitely small *simulacra* of all that shall possibly proceed from that germ must be hidden there. But what does this mean? It means that in the germ of the acorn are contained the *simulacra* of the oak that shall proceed from it, and of all the acorns that oak shall bear, and further of all the oaks those acorns shall produce; and as from a single acorn all the forests of earth may be filled with oaks, it means that all these are contained, fold within fold, millions of times repeated, in the germ of a single acorn. An hypothesis manifestly absurd.

Let us consider this germ a moment. What is it? In the case of any organism it is a speck of jelly-like substance, similar to albumen, or the white of an egg. Scientists call it protoplasm. Not only does the germ consist of protoplasm, but with it the entire organism is built up. This protoplasm, so far as science can determine, is absolutely *structureless*. And what is very surprising the protoplasm of all plants is identical—examined by the chemists, its molecules are composed of the same elements, combined in the same proportion; placed under the microscope no difference is discernible. And still more surprising is the fact that the protoplasm of *all living* beings is identical. The germ of the acorn, of the grain of corn, and the ovule of the worm, the bird, the fish, the elephant—nay, of man himself—are so identical that science cannot distinguish between them, cannot tell which is which. It would be incredible were we not assured of the *fact*. However the germs are to develop,

into whatever diverse and strange forms, whether destined to grow into the sturdy oak to withstand the storms of centuries, to adorn a lady's flower-garden as the rose or the lily, to creep or fly, to walk or swim. They are absolutely the same so far as science can determine.

Protoplasm is composed of Oxygen, Hydrogen, Nitrogen, and Carbon, and of it Mr. Huxley says: "Protoplasm, simple or nucleated, is the formal basis of all life; it is the clay of the potter." "Beast and fowl, reptile and fish, mollusk, worm, and polyp are all composed of structural units of the same character—namely, masses of protoplasm with a nucleus." ("Lay Sermons," 6th ed., pp. 127–129.)

What, then, determines the difference between different animals? What makes one little speck of protoplasm grow into an elephant, and another exactly the same into a man? It must be a mysterious something that has entered into this protoplasm. No eye can see it, no science can define it. There is a different something for the elephant and a different something for the man; so that, though both use the same matter, they build it up in these widely different ways. Protoplasm being the clay, this something is the potter. And as there is but one clay, and yet all these curious forms are developed out of it, it follows necessarily that the difference lies in the potters. There must be, in fact, as many potters as there are forms, and, since the *individuals* of the same species differ by heredity, as many potters as there are individuals.

To understand unmistakably that it is really the potter that does the work, let us follow a description of the process as observed by Mr. Huxley. Through the tube of his microscope he is watching the development out of a speck of protoplasm of one of the most common animals. "Strange possibilities," he says, "lie dormant in that semi-fluid globule. Let a moderate degree of warmth reach its watery cradle, and the plastic matter undergoes changes so

rapid, and yet so steady and purpose-like in their succession, that one can only compare them to those operated by a skilled modeler upon a formless lump of clay. As with an invisible trowel the mass is divided and subdivided into smaller and smaller portions, until it is reduced to an aggregation of granules not too large to build withal the finest fragments of the nascent organism. And then it is as if a delicate finger traced out the line to be occupied by the spinal column, and molded the contour of the body, pinching up the head at one end, the tail at the other, and fashioning flank and limb into due proportions in so artistic a way that after watching the process hour by hour one is almost instinctively possessed by the notion that some more subtle aid to vision than an achromatic would show the hidden artist with his plan before him striving with skillful manipulation to perfect his work." ("Lay Sermons," 6th ed., p. 161.)

§ 31. In view of the whole subject, then, we affirm with great certainty that the directive force in organic development resides, not in the matter, structured or otherwise, but in the *life* that resides in the protoplasm, and that therefore the life cannot be a function of that which it constructs—it is the *cause*, not the result, of organic structures. And hence we confidently confirm that it is an entity that builds its home according to a plan stamped upon itself—the organism being simply an incarnation of the resident life. We conclude this paragraph by simply adding that *nature has no protoplasm unconnected with life.*

§ 32. The scientific law by which all this takes place is the *law of conformity to type*. It is contained, to a large extent, in the ordinary law of heredity; or it may be considered as another way of stating what Darwin calls "the law of unity of type." Darwin defines it thus: "By unity of type is meant that fundamental agreement in structure which we see in organic beings of the same class, and which

is quite independent of their habits of life.”* (“Origin of Species,” p. 166.)

§ 33. In further support of our views of this subject, we insert an extract from the “Encyclopedia Britannica:” “Thus molecular science sets us face to face with physiological theories. It forbids the physiologist from imagining that structural details of infinitely small dimensions can furnish an explanation of the infinite variety which exist in the properties and functions of the most minute organisms.

“A microscopic germ is, we know, capable of development into a highly organized animal. Another germ, equally microscopic, becomes, when developed, an animal of a totally different kind. Do all the differences, infinite in number, which distinguish the one animal from the other arise each from some difference in the structure of the respective germs? Even if we admit this as possible, we shall be called upon by the advocates of pangenesis to admit still greater marvels. For the microscopic germ, according to this theory, is no mere individual, but a representative body containing members collected from every rank of the long-drawn ramification of the ancestral tree; the number of these members being amply sufficient, not only to furnish the hereditary characteristics of every organ of the body, and every habit of the animal from birth to death, but also to afford a stock of latent granules to be passed on in an inactive state from germ to germ, till at last the ancestral peculiarity which it represents is revived in some remote descendant.

“Some of the exponents of this theory of heredity have attempted to elude the difficulty by placing a whole world

* Clearly erroneous. “The fundamental agreement in structure” is *not independent of their habits of life*, but *indicates* and *necessitates* those habits, as we shall see when we come to consider the law of adaptation and instinct, and as might be indefinitely illustrated in considering any one species of animals.

of wonders within a body so small and so devoid of visible structure as a germ, by using the phrase 'structureless germ.'

"Now one material system can differ from another only in the configuration and motion which it has at a given instant. To explain differences of function and development of a germ without assuming differences of structure is, therefore, to admit that the properties of a germ are not those of a purely material system."* ("Encyclopedia Britannica, Vol. VIII., p. 42.)

§ 34. Taking now, briefly, a retrospective view of our arguments thus far, we see:

1. A power outside of nature giving rotation to the nebulous mass.

2. A law of catastrophe throughout interrupting secular processes.

3. The beginning of life on our globe to have been a catastrophe, an interruption of ordinary natural process by a power from without—the scientists' "force that maketh for righteousness."

4. That under the law of science, *omne vivum ex vivo*, and the axiom, *nihil ex nihil*, this force that makes for righteousness must itself be living, and therefore a person, even the supreme first cause of all things.

5. That life is not a function of structured matter, but is itself the builder of the structure, each kind of life bearing by heredity the type of its species, *every organism being an incarnation of a living entity*.

6. That the Darwinian hypothesis of evolution is demonstrated not to have been a fact by the irrefragable testimony of the rocks.

7. That therefore the introduction of new species, continuously all along the ages, must have been, as to mere

* There must, therefore, be in the germ something more than matter.

material nature, *ab extra**—the work of the Supreme Will controlling, directing (most likely) natural causes and processes.

8. That the general progress was ever upward from the protozoan to man.

* If science gives up the intermediate links between species, as it seems she will be compelled to do, and admits that new species sprung from pre-existing species, *per saltum*, then it would seem that science must also postulate a directive *mind*, guiding and controlling evolution according to the counsel of his own will.

CHAPTER V.

§ 35. Law of Adaptation. Science deduces this law of complete adaptation to environment, for purposed mode of life in all organisms, by *a priori reasoning*, whatever be taken as the working force of development. On the Darwinian hypothesis of evolution it must result, as the progressive variations would only be permanent, so as to attain to specific differentiation, when the individuals were adapted to their environment, and this is all the law means. We must observe, however, that the adaptation might not be *perfect*, and yet the *residuum* of force be sufficient to secure a permanency adequate to the result. But on the other hand, if each separate species was the product of the supervising, directing influences of the Supreme Will, there would undoubtedly be expected a more, indeed most, perfect adaptation of each species to its environment for purposed mode of life. Does science bear evidence of this perfect adaptation to environment in all the multiplied thousands of organisms that exist upon our globe? We unhesitatingly assert that it does; that there is no single species of animals in which this perfect adaptation to environment is not found to exist. Adaptation to environment, and full equipment for purposed mode of life, is everywhere apparent. Science finds no exception to the law.

It was indeed at one time alleged that the sloth furnished the exception sought for, but a more perfect acquaintance with its habits destroyed the illusion. It was at length found to be as perfectly adapted to its mode of life as all the rest of the animal world. This adaptation is both *morphological* and *physiological*; morphological, as seen in the

form of the bird fitted for swift motion through the air, and of the fish and *cetacea* for like movement through the water. Let the mathematician summon the resources of his highest analysis to determine the best forms for facile movement through the air and through water, and his results will be found exactly illustrated in the form of the bird for the former and of the fish for the latter.

§ 36. It has been alleged that deformities appear in nature, especially among some fishes, and this is undoubtedly true if by deformity we understand *departure* from the common type of other races, the form of man being taken as the symbol of perfection. But this departure from the ordinary type tells us nothing as to adaptation; it may well consist with the most perfect adaptation to purposed mode of life. We quote from Bushnell ("Nature and the Supernatural," p. 209): "Regarding man as the highest form of organization, having a head, neck, two hands, and two feet—the latter answered by the four legs of the beast, the two wings and two legs of the birds, and the four fins of the fishes—every creature will be most perfect in form when his parts are adjusted most nearly, according to the human analogy; and it is found that all the first fishes were actually in this type of agreement. In the second formation the forward fins are found to have slid up (not seldom), and to have stuck themselves close upon the head, leaving no neck, much as if a man were to appear with his arms fastened to his head close behind his ears. In a later formation both fins, representing hands and feet, have mounted to the same position; and as if this were uncomfortable, some races have dropped a pair altogether. Then next in the chalk formation, when the nearest vicinage to man is attained, appear the remarkable order that includes the plaice, the turbot, halibut, and flounder, the two latter of which are familiar in our American waters. They have the four fins stuck close upon the head; they are capsized, so

as to swim on the flat side; the mouth is twisted, so as to accommodate their false position; the two sides of the jaw do not match, one being much larger, and having three or four times as many teeth as the other; the backbone is lateral, occupying one side of the body; one eye is fixed in the middle of the forehead, and the other, which is much smaller, is thrust out upon one of the side promontories of the face." Now let it be noted that all this is entirely consistent with the most perfect adaptation to purposed mode of life, and that, indeed, this latter, *the final, cause of these fishes* absolutely necessitated the departure from the normal type; *so that there is no monstrosity here.*

§ 37. This so-called malformation cannot be taken, as Bushnell seems to think, as the work of an evil demon, unless it should appear that all these animals, from their peculiar form, were out of adjustment with their environments and to the mode of life to which they are shut up, which is not true, since they, with all other animals, are so constituted, so adapted inwardly and outwardly to their environment, as to find each its measure of happiness in pursuit of its own proper course of life.

This morphological adaptation might be illustrated indefinitely by reference to the different species of animals. We confine ourselves, however, to pointing it out in the numerous species of humming-birds, where in two respects it is markedly illustrated. Designed to feed on the nectar found in flowers, it was necessary that their bills should be so formed in shape and length that the individuals of each species could reach the bottom of the flower on which it was to feed; and again, that they should be able to remain in fixed position, poised in air while feeding, which is accomplished by giving them a peculiar form of wing, a power of immovable suspension that few birds possess, and *none except where it is needed for their modes of life.*

§ 38. We proceed now to consider the matter in its phys-

iological aspect, and here we find not only adaptation of outward form, but that this also involves a peculiar structure throughout the animals of each species—that is, that every animal has its internal structure throughout peculiar to its own species, and precisely adapted to its mode of life.

Thus, the carnivora—beasts of prey—are all unguiculates, having five toes armed with claws, teeth for tearing flesh, and stomach and digestive apparatus for assimilating it; indeed, every part of the structure is physiologically adapted to this mode of life. And the herbivora are unguiculates, having hoofs, teeth suited to mastication of vegetals, and stomach and digestive apparatus suited to the assimilation of vegetable substances. And so far-reaching is this law of adaptation in these and all other animals, that every part, even to the least—every bone, tendon, muscle, tissue—has its own structure peculiar to the type of its possessor. As Paul (1 Cor. xv. 39) affirmed more than eighteen centuries ago, “All flesh is not the same flesh; but there is one kind of flesh of men, another flesh of beasts, another of fishes, and another of birds;” so that one skilled in comparative anatomy is able to identify the type of the animals from any small part in his possession. In illustration of this, it is recorded that the scientist Owen received from Australia a small piece of bone, with a request that he would determine to what animal it had belonged, and he decided that it had formed part of the skeleton of a gigantic bird, long extinct, and wrote to the party who had sent the specimen to him, asking that search be made for the entire skeleton. And it happened that the ship that bore his request passed in mid-ocean a ship from Australia bearing to him the entire skeleton of the bird, which had been found and forwarded to him. The skeleton was found to correspond precisely with the description previously given by him. In further illustration of this adaptation, we may add that animals whose habitat is in subterranean waters, where no

light penetrates, have no eyes, having no need of them, as witness the eyeless fish and craw-fish of the Mammoth Cave in Kentucky, and of subterranean waters generally.

§ 39. Let it be further noted that this adaptation is so precise that there are throughout no deficiencies, no superfluities of power or capacities. Each species is perfectly adapted to its environment, for its purposed mode of life, its place in nature; *nothing wanting—no surplusages*. In either case, unhappiness would be the result. If there were deficiency in the powers or functional operations within to meet the environment for purposed adaptation to mode of life, this would result in a feeling of want, unrest, and consequent unhappiness. If, on the contrary, there were surplusage, redundancy of powers, with nothing in the environment to meet and satisfy such powers, there would equally result a feeling of want, unrest, and consequent unhappiness.

Finally, on this point, we affirm unhesitatingly that nature furnishes absolutely no exception to this law of perfect adaptation of every living thing to its environment and purposed mode of life—its destiny—and that this adaptation extends to the entire structure, internal and external, morphologically and physiologically, and challenge the production of a single exception to the law among the innumerable species of earth.

§ 40. Having seen that the law of adaptation is universal, we notice in the next place that this adaptation simply consists in the perfect adjustment of powers, faculties, sensibilities, mental attributes, instincts (to be considered more fully presently), and functional work of the individual structure, morphologically and physiologically, to the environment in such guise as to secure the happiness of each according to its measure.

The organs of sense are, each and all, avenues of pleasure to the possessor. The proper food of each animal is

pleasant to its taste and smell; the breathing is a pleasure; light is pleasant to the eye. The internal processes are so arranged that they are sources of pleasure, and we observe that this is the orderly working of nature in every part of the domain of animal life.

On this point the author of the "Vestiges" says, page 185: "That enjoyment is the proper attendant of animal existence is pressed upon us by all that we see and all that we experience. Everywhere we perceive in the lower creatures, in their ordinary condition, symptoms of enjoyment. Their whole being is a system of needs, the supply of which is gratification, and of faculties, the exercise of which is pleasurable. When we consult our own sensations we find that, even in a sense of the healthy performance of all the functions of the animal economy, God has furnished us with an innocent and a very high enjoyment." "The mere quiet consciousness of a healthy play of the mental functions—a mind at ease with itself and all around it—is in like manner extremely agreeable."

Science must therefore conclude that the power that worked to this result must be taken to be benevolent, if it be made evident that this condition of things be not the result of the working of merely natural material forces—a conclusion clearly negatived, as we have seen by geological records.

§ 41. How, then, have some scientists declared that if the process of evolution had ceased at, say the reptilian age, reason would have concluded it to be the work of an evil demon? Does an evil demon work for joy in its creations? No! Good does not proceed from evil; but evil, and evil only. *God may overrule evil for good, and doubtless will.* But that is quite another thing. If, as we have seen, the entirety of things as presented to us bears the impress of a benevolent, all-powerful, Supreme Will, then this impress must be seen on each and every part, if

only we have eyes to see; so that, stop the development at whatever point you will, the portion already in existence must bear the impress of the same benevolence. Only let it be observed, in that case, our reason might be at fault, and certainly would be, in determining the *final cause* of the unfinished, partial evolution.

It is only when the whole plan is before us finished that we are able to judge of the wisdom evidenced in the adjustment of the parts. The whole edifice must be completely in view, from the foundation-stone to that which crowns the building, before the glory of the structure becomes fully apparent.

So, to the Christian philosopher, every part of creation's plan, from the protozoan to man, bears evidence of the Creator's goodness; and yet, the whole plan not being before him, he must perforce await the final development in the further evolution (to be considered further on) before the full glory of the plan shall burst upon his enraptured vision.

§ 42. But, it may be asked, what of death? Does death already and always in the world consist with the character of benevolence you assume to belong to this all-powerful Supreme Will? Assume? There is no assumption about it. All nature tells of benevolence. But the answer is ready. Most assuredly it does. It seems to us axiomatic that *that* thing or event which makes for the greatest happiness of the entire world of living beings *cannot be considered an evil*.

First, we observe that the relation between parent and offspring, with its wealth of love, the social relations between individuals of the same species, so generally witnessed among animals of every grade, form no small part of the universal happiness blessing the animal world.

Again, to our human reason, there appear possible but two plans on which the Creator could have provided for

peopling the world: First, by creating by special fiat every individual of all the tribes of earth, and conferring upon all the gift of immortality; and, in that case, what a meager, tame, unsatisfactory world it would have been, bereft of the sweet joys that flow from the parental and family relations. And then again, what would result with a world of men (of women there would be none) immortal and in rebellion against God. And if men, as now constituted, with all the sweet restraining influences thrown around them by family and social relations, come to such a pitch of wickedness during their brief life, what would be the result in the case supposed? They would surely become devils incarnate, as indeed many seem to do as it is.

The other mode, and the only other that we can conceive of, is *that* seen to exist—viz., the creation of each species by one or more pairs with the power of reproduction. But let us see what this involves. A little calculation proves that death is absolutely necessary to the system. Thus: Two sparrows, for example, nesting, produce two fledgelings the first year, the four produce eight the second year, and so on, doubling in number every year, and, there being no death, the number of sparrows at the end of any year would be represented by the sum of the series $2 + 2^2 + 2^3 + 2^4 + \dots + 2^n$; and what does this amount to? Why, simply to this: that at the end of a century, if we estimate each sparrow to have a volume of a cubic inch, the volume of sparrows would exceed that of this world many times over. Similar results will follow, whatever animal, however small, be taken as the basis of our calculation.

Death, then, is, and always was, necessary to the present order of things. But it may be asked, What of violence? Why the beast of prey? Would not death by old age be a more merciful remedy? Surely not. Consider what this involves: the slow decay of powers, till, unable to procure food, the poor animal passes away by starvation. The pro-

vision to maintain an equilibrium of population by animals of prey is certainly the most merciful.

Dr. Livingston, the celebrated African explorer, relates that on one occasion when traveling in South Africa with a guard of natives he was seized by a lion, which shook him much as a terrier does a rat, and that he was so dazed by the shaking as to be utterly *devoid of any sense of fear or pain*. The remark is suggestive. It would seem that the instinct in the beast of prey to shake its victim was given for the very purpose of rendering the sacrifice of life as painless as possible; so that nature, or rather the God of nature, has made provision for the catastrophe of each life with the least pain to each victim. And as the preying animal derives food and pleasure with the greatest amount of happiness to the whole, therefore we cannot regard death as an evil.

It may be objected that the life of the herbivorous animal must be one of constant terror from fear of beasts of prey. This cannot be true, as facts within the writer's memory go to prove. Many years ago he had a tame deer – a pet about the house, at liberty to go and come when he pleased. Well, when Bobby was grown he would frequently go out and range the country until he got the hounds after him, when he would give them a chase of miles, until tired or pressed, when he would return to the house and take refuge in the kitchen. This happened so often that the writer became satisfied that Bobby enjoyed the chase.

CHAPTER VI.

§ 43. Law of Instinct. Having discussed thus at some length the law of adaptation, with its sequence, we proceed to consider another universal law of animate beings, intimately connected with that of adaptation, and essential to the working of that law—viz., the *law of instinct*:

Instinct may be variously defined. Thus: That propensity or tendency in every animal to present the power of faculty *within* to *that* in the environment to which it is adapted or adjusted; and, further, the propensity to do *that*, whatever it may be, that is necessary to reproduction and the preservation of its offspring. Or, instinct is a blind, innate impulse, from a nervous organization and corresponding disposition, directing all the individuals of the same species to the same ends by the use of the same means. This law of instinct is so universal, so manifested in all animals, that it is difficult to choose from the great mass of facts appropriate illustrations.

It must be observed as necessary to the very idea of instinct, and as an essential part of the law, that whatever it leads the animal to do, the *environment contains a somewhat* answering to, adjusted to—*meeting* the act to which the instinct leads. Thus, the *new-born mammal immediately, instinctively seeks the teat*; therefore, there must be in the environment a teat answering to the instinct. The teat proves the instinct, and the instinct proves the teat as well. The operations of this law of instinct are seen everywhere, in all animals in thousands of different ways; in every animal seeking its appropriate food, as the mammal in sucking, the chicken in scratching, etc.; in the pairing of male and female

of every species; in the care of parents for their offspring; in the nesting of birds and reptiles; in the provision made by insects for the preservation of offspring they are never to see; in the preparation of many insects for their metamorphosis; and in the work of certain insects necessary to the propagation of certain plants, showing the correlation between the vegetable and the animal kingdom.

We proceed to give a number of illustrations sufficient to make the subject clear to the reader and to establish the law.

§ 44. 1. The *migratory instinct* exhibited in birds of passage, which often traverse immense distances, by night as well as by day, over seas as well as over land, often many hundreds of miles. This fact seems to prove them to be possessed of a *sense of direction* utterly inconceivable by us, since of some species the young migrate by themselves, so that their pilotage cannot be ascribed to experience. Besides, when traversing seas there are no landmarks to serve as guides.

2. The same sense of direction is possessed by many species of animals that are not migratory, enabling them to find their way to their accustomed haunts over greater or less distances, and always by a straight course, however devious may have been the course by which they were taken from home. Thus the evidence is unquestionable that this sense of direction is possessed by, at least, the bee, the homing pigeon, dogs, cats, horses, sheep, and cattle. There seems to be no limit to the distance over which these animals can find their way home.

3. The Norwegian lemming is known to migrate periodically westwardly, with the result that enormous numbers of them perish in the ocean which they attempt to swim.

4. Mr. Mivait relates of a certain wasp-like animal that stings spiders in a certain part of the cephalo-thorax region, thus paralyzing without killing them, which it then

stores away with the larvæ of the fly, to serve as food for them when they quit the egg.

5. The female of the stag-beetle excavates for itself, as preparatory to passing into the chrysalis state, a hole exactly its own length, while the male larva fashions for itself a *hole of double* its own length, so as to provide room for the growth, during its unconscious condition, of horns equal to its own length.

6. Birds build their nests preparatory to incubation before the eggs appear, and are possessed of the brooding instinct.

7. The chick of the domestic fowl, scratching for food, even if hatched without the intervention of the hen, and when kept separate from all its species.

8. In the moth and butterfly, depositing their eggs on the precise substance suited for the food, not of themselves, but of the caterpillar.

9. In the dragon-fly, an inhabitant of the air, depositing her eggs *in the water*, alone adapted to her young.

10. In the gad-fly depositing its eggs only on that part of the horse where they are more likely to be transferred to the horse's stomach, where the bot alone finds its home.

11. In the salmon and other fishes seeking the head-waters of streams to deposit their eggs.

12. In the violet crab of Jamaica, which performs a long and fatiguing journey of months from her mountain retreats to the sea, where she deposits her spawn in the open sea, and sets out on her return to the mountains.

13. In the correlation between certain insects and certain flowers, which need their visits in order to fertilization. It is not necessary to particularize here. The fact is so well known, and so general, that illustrations are deemed unnecessary.

§ 45. In fine, it is a fact that every species among the innumerable hosts of animate nature has its own special instincts, working in its own adaptation of the internal pow-

ers and faculties to its environment, the well-being of the individual and the permanence of the species.

We pause to ask, Whence these instincts? Scientists are in the habit of referring them to *heredity*. This cannot account for them, since their *commencement* could not be hereditary. Again, to *natural selection*; but this postulates the truth of Darwin's theory of evolution, which we have proved to be discredited by the records in the rocks. Besides, in most of the instances cited, neither of these hypotheses will account for the origin of the instinct. For instance, how came Mr. Mivait's wasp (4), in the first place, to sting the spider in that particular point necessary to the desired result? Was it accidental? and repeated accidentally until it became a habit so as to be transmitted to its progeny?

And what of the case of the stag-beetle (5), perhaps the most wonderful of all these wonders? Is that also heredity? No; instinct is intelligent and wise, wondrously selecting means, and skillfully adjusting effort to ends. The intelligence does not reside in the animal; the wisdom does not belong to it. There must have been a Creator, who did both know and intend that his creatures should do just these things and nothing else. Instinct must be the intelligence of the Creator in the animal. The unreasoning, unintelligent animal works unerringly, because the inspiration of the All-wise makes it wise without reason and beyond reason.

Instinct, as a law of nature, is God's way of working in the animal for its own good and his own glory—his way of working.

Finally, we lay it down as a law of nature, universal and incontrovertible, *that there is in every case a somewhat in the environment that answers, is adjusted to, the instinct. There is, there can be, absolutely no exception to the law, and this we lay down comprehensively as the law of instinct.*

It has been asserted that instinct *always* works for the good of the animal and the species, and that therefore it is the product of natural selection. To this the answer is ready, that assuredly instincts were *generally* given to the animal for its own good, or the good of the species, but *not always*; as witness the instance of the moth, whose instinct to seek the light leads to its destruction, certainly not for its own good, but for the good of others, as of the farmer who makes use of this instinct to prevent the utter ruin of his crops from the over-multiplication of its various tribes. And again, witness the case of the Norwegian lemming, where the migratory instinct leads to the destruction of the entire migrating host.

CHAPTER VII.

§ 46. Law of Continuity. We have seen how science arose from classification of phenomena, and how science developed—revealed—the great laws of nature; that is, the orderly lines along which nature ever proceeds in all things, living and dead.

Now, in contemplating these laws we find that there is, as there ought to be, a relation between them, since nature must ever work harmoniously; that they run, so to say, in parallel lines, and are correlated at every point. Hence we deduce a law of laws, which is called the *law of continuity*. Thus the law of gravitation, the law of catastrophe, the law of the luminiferous ether, the law of life,* the law of evolution, the law of conformity to type, the law of adaptation, the law of instinct, while distinct each from all the rest, are interworking and co-working in nature in perfect harmony each with all, resulting in the grand harmony of the whole visible universe.

It will therefore be seen that these several laws, indicating the lines along which all forces—*resident in*, or *acting upon*, nature—proceed, must have a real harmony among themselves; so that, reasoning upon what we observe to be

* As we have seen, life cannot be accounted for from the working of the molecular and chemic forces in nature, and while an apparent break in the orderly course of nature is not really a break at all, it is most assuredly an interjection into the established order of nature, *by the Creator and Lord of nature*, whose *will* is nature's law. Such interjections will be seen to have occurred all along the line of evolution, and hence to be no breach of the law of continuity. We remark that the fact of science being unable to account for the introduction of life proves it to be a stranger, and not within the purview of its system.

or to have been in nature, we shall never be put to confusion, but may confidently, from what *has been*, deduce *what shall be* in the endless future.

This is the law of continuity. It is opposed to the fortuitous, to mere chance; and if, as may very well happen, any thing out of the usual order of nature occurs, and we cannot account for it, we are absolutely certain that its unaccountability results simply from our ignorance, and that if we knew all the forces at work it would be seen to range itself at once under the reign of law—the law of continuity.

§ 47. No exact definition of this law is to be found. One can get a clear idea of it only by illustration. “In point of fact, its sweep is so magnificent, it appeals so much more to the imagination than to reason, that men have preferred to exhibit, rather than define it. Its true greatness consists in the final impression it leaves on the mind, with regard to the uniformity of nature, for it was reserved for the law of continuity to put the finishing touch to the harmony of the universe.” “One of the most striking generalizations of recent science is that even laws have their law. Phenomena, first in the progress of knowledge, were grouped together, and shortly nature presented the spectacle of a cosmos, the lines of beauty being the great natural laws. So long, however, as these laws were merely great lines running through nature; so long as they remained isolated from one another, the system of nature was still incomplete.

“The principle which sought law among phenomena had to go further and seek law among the laws. Laws themselves, accordingly, came to be treated as they treated phenomena, and found themselves finally grouped in a still narrower circle. That inmost circle is governed by one great law—the law of continuity. It is the law of laws.” (Drummond, pp. 37, 38.)

As further illustration of this law, we remark that the spectroscope has proved that the same matter of which the earth is constituted exists also in the sun and all the fixed stars, thus extending the law of gravitation to the entire visible universe; which fact, indeed, might have been deduced from the law of continuity.

§ 48. This law assures us that whatever has occurred at any time, anywhere, in all the universe, *that same thing will always occur under exactly the same circumstances.*

Continuity necessarily excludes any break whatever in the orderly procedure of nature, and if any such break or catastrophe seemingly occurs that cannot otherwise be accounted for, compels true science to admit the presence of a force *ab extra*, the *visible* universe, operating upon, and working with, natural forces. (See foot-note, page 83.) In such case, indeed, such force, whatever it may be, must be included in nature, and thus compels us to extend the signification of the term to include all that *is*, visible and invisible—all worlds, with all that is in them, God, angels, potentates, powers, dominions—in which case *nature*, in its limited signification, dwindles to a mere fractional part of all that *is*.

§ 49. Thus the creation of the matter of the solar system (which, as we have seen in Section 9, occurred in *time*), the rotation given the nebulous mass, the introduction of life upon the earth, the introduction of new species, the old having perished, etc., were not infractions of the law of continuity, the very same things having occurred in all worlds from the beginning, when in the creation of material or immaterial substances, dead or living, the laws of their being sprung from the nature impressed upon them, and *that* nature from the nature of the Creator himself. *He is one*, hence there must be an identity of law in all his works.

§ 50. It may be objected that the laws of one kingdom

cannot be identical with those of another, and hence there is a break in continuity; that the laws of the mineral kingdom are different from those of the vegetal, and these from the laws of the animal kingdom.

The difficulty is only apparent. It must be remembered that law says nothing of cause or force; is simply an expression of mode or manner of being. and hence arises from properties or characteristics of things—in fact, the laws of the inorganic kingdom do pervade and make themselves felt in the higher kingdoms, and wherever else there is matter. The laws of the vegetal life do not descend to the lower kingdoms, simply because there is no *life* there, and so no modes of life; and so of the higher animal kingdom. Wherever there is life the laws of life control, varying only with the *nature of the life* and always observing and securing the integrity of continuity.

CHAPTER VIII.

§ 51. **Classification.** We proceed now to notice briefly the classification science has made of things visible—the multitudinous objects of sense that surround us on every hand.

The general classification may be briefly stated as follows: (1) The mineral kingdom; (2) the vegetal kingdom; (3) the animal kingdom. In one or the other of these kingdoms all things in the visible universe will be found to take their place. Although there may be a border-land between the vegetal and the animal kingdoms, in which organisms are found which the scientist finds it difficult to place, the difficulty will be found to arise solely from his ignorance of the real nature of these organisms. Were this fully known they would at once take their place in their appropriate kingdoms.

So, also, it may be well in this connection to remark that there will be found in the progress of our discussion at the summit of the animal kingdom a border-land, imperatively demanding, as supplementary to the scientific classification the assignment by science of a fourth kingdom—viz., the spiritual kingdom—since we shall surely find in man faculties, powers, capacities, adaptations, instincts that definitely separate him from the mere animal, and compel his assignment to a higher kingdom.

§ 52. **The Mineral Kingdom.** To the mineral kingdom science assigns all objects of sense that do not manifest the phenomena of life—mere dead matter—the elements, simple or combined, subject to the laws of gravitation and of forces—molecular and chemic alone—by the operation of

which forces, aided by the forces which are considered as the product of vibrations of luminiferous ether, under the directive power of the Supreme Creator, all the beautiful order of the finished earth is to be ascribed.

Having considered, under the head of gravitation (Section 8), the scientific view of the formation of the several planets which belong to the solar system, we now proceed to consider briefly the process of the earth's completion as a fit residence for him who was to subdue and rule her.

As seen under the paragraph on gravitation (Section 8), when the earth had so far cooled as to permit it, the watery vapor surrounding her as a dense atmosphere impenetrable by solar rays was precipitated, covering the entire spheroid with an ocean. Then portions of the cooling crust sunk, while other portions were raised above the water's surface. Then began the wearing down of the emerged portions and the deposition of sedimentary strata that has continued ever since. There were repeated subsidences and elevations of land and of sea-bottom, both secular and catastrophic—secular during the deposition of conformable beds, catastrophic in the change from conformability to unconformability of strata.

These changes occurred repeatedly, as witnessed by the strata wherever they are accessible to observation. The grand residuum of movement in the continental masses being upward, and of the ocean's bed downward, and while, as above stated, there was always a catastrophic movement in passing from conformable to other beds lying upon them unconformably, the grander catastrophes are seen to have occurred in those vast disturbances accompanying mountain-making; so that the strata bear evidence everywhere of ever-varying elevation, depression, overturning, contortion, and denudation, until the earth attained her present face.

§ 53. Now we call attention to a very suggestive fact—that the elementary substances were originally so adjusted

relatively in quantity as to leave an atmosphere of mixed Oxygen and Nitrogen, exactly adjusted to animal life, and that the quantity of CO_2 was such as to leave exactly enough in our atmosphere for plant sustenance, after the vast, incalculable quantity of carbon had been taken from the air and stored up in the coal-beds and otherwise. Were carbonic acid gas (CO_2) in greater proportion it would be deleterious to animal life, especially of the higher animals, and if in less it would not suffice for vegetal life. Was all this fortuitous? That seems to us incredible.

And again, in the same line of thought we point out the fact that it is a law of nature that heat expands all substances, and that the withdrawal of heat is followed universally by condensation, and consequent contraction of volume, with increase of specific gravity. Now, there is *one*, and, so far as we know, *only one* exception to this law, and *this one exception is absolutely necessary to the habitability of the earth*. We allude to the case of water, which, growing colder, contracts in volume down to about 40° Fahrenheit, and then expands, as it grows colder, until at 32° Fahrenheit it becomes solid (ice).

If this exception to the general law were not made ice would *sink*, and, being covered by depths of water, the summer heat could not melt it, water being a very poor conductor of heat, and thus all deep waters would become solid ice, the ocean itself becoming a solid bed of ice and the earth a frozen world and unadapted to animal or vegetal life.

To this reasoning it may be objected that some metals exhibit the same departure from the general law; but the case is different, for these metals only expand in the *act* of crystallization, from (as is supposed) the re-arrangement of molecular position, while water begins to expand long before this re-arrangement begins. Here then we have an exception to a general law, and this exception absolutely necessary to the habitability of the world.

Is not *this one universally known fact demonstrative evidence of intelligent purpose in the ordination of things?* Does it not demand imperatively the postulation of an infinite Creator in directing and controlling the forces of nature?

§ 54. It may be further observed that without those repeated dislocations and upheavals of strata into mountain-chains the flat and even-surfaced earth would have had no springs, and the greater part of it would have been uninhabitable. And again, but for the vast denudation that has taken place everywhere, and especially in the glacial epoch, the tiller's toil could not have met such abundant reward.

And still further, the location of the highest mountain-chains, facing the broadest oceans, seems to have been adjusted in the interest of Christianity and high civilization. Had the Rocky Mountains replaced the Appalachian chain North America, in great part, would have been desert; and had a lofty chain of mountains like the Andes occupied the western border of Europe, we can hardly estimate the loss to humanity that would have resulted. Behold the actual result of the arrangement of the continental masses—the highly civilized populations of Europe and America facing each other, with only the Atlantic ferriage between, facilitating their intercourse, promoting their commercial interests, and enabling these Christianized peoples to extend the influence of their high progress in the arts and sciences and Christian influences among all the populations of earth.

Was there no design in all this? Can it be believed that the arrangement was merely fortuitous?

§ 55. **The Vegetal and Animal Kingdoms.** We come now to consider the progress of life upon the earth, and remark that it will appear that besides being a *development*, it was most probably an *evolution*.

Life beginning in the lowest class of plants, the *fucoi* or sea-weeds, passed into the animal in the protozoan, then was

manifested in the mollusk, the radiate, and the marine articulate—being chiefly marine, because the land was not yet fitted for occupancy by living beings. During that early period of the earth's history both atmosphere and ocean were unfitted for the higher order of living beings. They could neither exist on land nor in ocean. The atmosphere was loaded with carbonic acid gas (CO_2), and the oceanic waters were heavy with salts of calcium; since all the carbon now stored up in coal-beds and elsewhere formed part of the atmosphere in the form of CO_2 , and all the lime found in the immense beds of limestone was then dissolved in ocean's waters, either as carbonate or phosphate. These calcium salts must be eliminated from the waters ere any but the very lowest grade of animals could exist therein. This was accomplished by the mollusks, radiates, and marine articulates—the trilobites, crinoids, corals, and mollusks, the greatest part of whose weight was calcareous—with which the ocean swarmed in that early period. When these workers had segregated from the ocean's waters the excess of calcium salts, and deposited them in sedimentary deposits, which constitute the limestone beds of to-day, then, and not till then, could the true fish appear.

This happened in the latter part of the silurian age, when the ganoids (the first fishes) appeared *abruptly, without precursors*; with eyes—not rudimentary, as would be expected on the Darwinian hypothesis, but as perfect as the eye of the fish of the present time. And, indeed, we may here remark that long anterior to this, in the early history of life, the trilobite possessed the perfect eye.

Again, it may be observed of the ganoids, which so recklessly break through Mr. Darwin's theory of evolution, that they were fishes, not only of the higher order, but were of the comprehensive type, foreshadowing the reptiles that were destined to appear only after the lapse of ages.

§ 56. It may be further remarked that in the progress of

climate and of condition of atmosphere and oceanic waters the tribes of animals were localized in *time*, just as they are now localized by the diverse climates of different regions; and that as the climate and other conditions changed, existing species and tribes disappeared, and were replaced by others adjusted to the new conditions. The culmination of reptiles and mollusks in the reptilian age are examples of this localization in time, just as there are different tribes of animals and plants in the different zones of climate in passing from the tropics to the poles. So, from the silurian, the age of a universal temperate climate, the fauna and flora changed as the climate grew colder.

We further remark that the progress was ever accordant to *system*. For example, before the silurian age closed the fundamental type of the vertebrates was exhibited on a general plan that has been followed in its main features ever since, and progress was exhibited in the complete development of the fundamental idea. Thus the two pairs of fins in the fish are represented by the four limbs of the higher vertebrates, the air-bladder of the fish by the lungs, etc., and so throughout the structure.

Further, it was a system of progressive specialization; for while in the earlier animal all the functions were performed by one protoplasmic mass, in the development these functions were assigned successively to special organs. It was a system of progressive cephalization; in fact, all progress being necessarily shown in increased cephalization, since it is only through the nervous system that animals are brought into correspondence with external nature.

This increase in brain mass finds its limit in *man*, and *no further progress in this direction seems possible*.

This adherence to system in progressive development does not negative the Divine Existence in, and supervision of, nature, but rather confirms and exhibits his presence, it being the only view of the progress of life that is consistent with

the theory of its divine origin; for were there not such adherence to system and to regular order in development, constituting a fixed *law* of evolution, this would be complete demonstration that the progress was not ordered and controlled by a Being of infinite wisdom. And again, if the progress be divinely ordered it must exhibit not only system but adjustment as well to the changing environments of the successive species, as is found to be the fact.

§ 57. Again, we observe that the earliest species of a tribe were not necessarily the lowest, as has been seen in the case of the ganoids, and that there are many examples of the same fact.

Again, the transitions between species, genera, and tribes were generally *abrupt*—not gradual, as required by Mr. Darwin's theory of evolution. The survey of the earth's history discovers, as all geologists admit, almost no instances of gradual transition from species to species—not nearly as many or as close as is observed in the present fauna and flora.

Mr. Dana says: "In the early tertiary age the world, as the fossils show, was full of true mammals, related to the tapirs and other kinds, many of great size, while no such mammal has yet been detected in any earlier beds. It is undoubtedly true that the break in the records with regard to the era preceding the tertiary is great; but this fact does not supply all that science needs for a perfectly confident explanation of the break in mammalian life. In the coal-bearing formation overlying the cretaceous, in the Rocky Mountain region, there are the bones of dinosaurs; while in the eocene, resting on these, there are remains of a wonderful variety of mammals, some of elephantine size. Probably a long time intervened between the eras of the coal-beds and the tertiary bone-beds; but however long the time that may be claimed, the abruptness of the transition is astounding, and needs facts for its full elucidation."

§ 58. The appearance of *man* without precursors is another example of this abruptness of transition. There is a very wide gap between the lowest of the human species and the highest man-ape, the volume of man's brain being fully double that of the highest ape; and the structure of the ape throughout requires quadrupedal locomotion, while that of man necessitates erect locomotion. But it is useless to pursue this subject further. The entire history of development abundantly justifies the author's conclusions as to the evolution of life on the earth.

§ 59. **Conclusions.** In considering the progress of the development of life, we observe:

1. That, as shown by the fossils in the rocks, specific lines were definitely drawn, even more so than among existing species.

2. That in the progress, at every step species were disappearing, and new species being introduced.

3. That at every change in the beds of strata there was more or less of this extermination of existing species and introduction of new ones.

4. That at the end of each epoch the extermination was more general, and at the end of each period almost always complete.

5. That, while the development was generally upward, it was not so always, the lower species of a tribe not always appearing first. It often happened, indeed, that, in the introduction of a new tribe, "*magnates walked first.*" (Hugh Miller.)

6. That often special forms arose without precursors, as fish in the later silurian.

7. That organs of sense, as the eye, appear to have been perfect when first found in the organism. As of the trilobite in the primordial, and of the ganoid in the upper silurian.

8. The existence of comprehensive types; a prophecy of species to appear in the distant future.

9. That the facts observed prove beyond reasonable doubt that science cannot deduce the phenomena of nature solely from forces resident in matter, and is compelled to recognize the presence of a force from the unseen universe immanent in all things, directing, controlling, evolving all things in regular systematic order—a force as unvarying as those of matter itself, but unlike these, having intelligence, benevolence manifested in the unspeakable beauty of a glorious cosmos; filling all space with joyous life, with whom *matter* is nothing, except as the basis of such life. Nor is this view at all derogatory, as some suppose, to the idea of an *infinite God*, since being *infinite* there can be no *little*, no *great* in *finite* things. A sparrow, to the infinite One, must be of more value than a world of dead matter. “Are not two sparrows sold for a farthing? and one of them shall not fall on the ground without your Father.” Nor is this in any wise a break in the law of continuity, since the very laws of thought not only allow the hypothesis, but imperatively demand it, as the recognition of this force in *one* case compels it, by the law of continuity, in all.

10. That dead matter cannot of itself attain to life. It must forever remain in the inorganic kingdom until the living organism, reaching down out of its own kingdom, takes hold of the dead matter and lifts it into its own kingdom. Plants use inorganic matter for assimilation. In like manner a vegetable organism cannot attain to animal life; cannot by any inherent force lift itself into the kingdom above it. The animal assimilates only organic stuff, the product of animal or vegetable life, and fixes it in its own organism as part thereof,

CHAPTER IX.

§ 60. Recurring to the law of adaptation, considered in Chapter V., Section 33, we proceed further to remark on this subject that the development of life proceeded *pari passu* with the environment, thus: The primeval waters were surcharged with calcareous matter in the form of carbonate and phosphate, and were unfitted for the higher forms of life, until animals that utilized these substances had caused their deposition in the sedimentary limestone strata, thus preparing the oceanic waters for occupancy by higher forms of life. The atmosphere was also heavily charged with CO_2 (carbon dioxide), and thus was not adapted to the existence of the higher forms of terrestrial life, until the abounding forests of the carboniferous era had eliminated the carbon from the atmosphere and deposited it in the abundant coal-beds, when higher forms of animal life could thrive in the purified air. Since that time there has been an equilibrium maintained by the operation of vegetable and animal life, the latter absorbing the Oxygen and emitting CO_2 , while the former absorbed CO_2 , and emitted Oxygen, thus maintaining the equilibrium. We observe also, as partly accounting for the uniform warm temperature of the earth in all latitudes in those earlier eras, that the atmosphere acts as a blanket, absorbing and retaining the heat from the sun, and also preventing the rapid radiation of that from the earth's interior heat. In those earlier eras the blanket was thicker, so that the remains of animals of types now existing only in temperate or tropical or sub-tropical regions are found in the higher, even the arctic latitudes.

Thus it is seen that the law of adaptation has always and

everywhere controlled, both in the vegetable and animal kingdoms.

Anterior to the carboniferous era, as said before, the atmosphere must have been so surcharged with carbon dioxide, and so deficient in Oxygen, as to be utterly unfit for animal life of the higher grade. A little consideration will be sufficient to prove this. Thus: For every pound of Carbon taken from the atmosphere by plants for subsequent storing up in coal-beds there must have been taken from the CO_2 and set free in the atmosphere $2\frac{2}{3}$ pounds of Oxygen, or nearly 900 quarts, so that, while this era stored up such abundant fuel for civilized man's future use, it also fitted the atmosphere for the higher forms of animal life. It may in like manner be seen that the waters of the ocean were unfit for the higher forms of life until toward the close of the upper silurian era, when the abundant oceanic life of preceding ages had eliminated the excess of calcium carbonate and deposited it in the limestone strata. It would hence appear that the author of the "Vestiges of Creation" erred when he says (p. 278): "The groves which formed the coal-beds might have been a fitting habitation for reptiles, birds, and mammals, as such groves are at the present day; yet we see none of the last of these classes, and hardly any trace of any of the first two in that period of the earth. Where Iguanodon lived the elephant might have lived, but there was no elephant at that time.

"The sea of the lower silurian was capable of supporting fish, but no fish existed. It hence forcibly appears that *theaters of life must have lain unserviceable, or in possession of a tenantry inferior to what might have enjoyed them for many ages.* There certainly would have been no such waste allowed where Omnipotence was working on the plan of minute attention to specialties. The fact seems to denote that the actual procedure of peopling the earth was one of a natural kind, requiring a long space of time for its

evolution." It would seem that a little consideration would have shown the writer that the same objection applies to his own hypothesis of Omnipotence *working by law*, since he could, so far as we can see, as well have so adjusted *law* that regions would be peopled as *fast as conditions allowed*, and it appears to us that this is precisely what the Infinite One has done, only the *law* being his own unchanging will.

§ 61. **Comprehensive View.** Taking now a comprehensive view of this grand system of life from the algæ and protozoan to the angiosperm and man, the question arises, "What view must science take of the causes in operation?" Can the development be accounted for by the operation of the natural properties of matter, dead and living? If so, science, according to her principles, must adopt the hypothesis of what is known as *evolution*. If it be affirmed that these *natural* (under the lower sense of the term) forces are sufficient to account for the entire system, an appeal must be made to the records in the bound volume of geology for a true history of the developments, and, as we have already seen (Sections 27, 28), these records bear unequivocal testimony adverse to the hypothesis. After all that may be said of the incompleteness of our examination of the records, the fact remains that the testimony of geology, so far as it goes, is manifestly adverse to the hypothesis. Whatever other evidence the fossils in the strata may give, they do manifestly declare that the progress from species to species was *per saltum*. And, if this be admitted, it appears to us that science must also take cognizance of a supreme *guiding Will*, ever present, and manifesting itself at every step, in all times. And why not? If science is compelled to admit the presence of this Supreme Will as a working force in any one case, then the law of continuity compels the admission of the same force throughout. Now, science renders unavoidable the conclusion that the entire visible

universe *began in time*, and, if so, we must cognize a Creator of matter. "*Nihil ex nihil.*" Again, it has been seen that the action of a force, *ab extra*, is necessarily cognized in the rotation of the nebulous matter of our system—and, indeed, of all systems—as also in the introduction of life on our globe. Hence the law of continuity requires the cognition of that force throughout.

§ 62. **Recapitulation.** In considering the progress of our argument thus far, we see that the evolution was both secular and catastrophic.

1. In the inorganic kingdom ever toward a perfected, complete world, at every step utilized by living beings, adapted to the condition of an advancing world, and every stage (in comprehensive type) a prophecy of what was yet to be, until the whole system was completed in the appearance of man, its coming lord.

2. General progress in the vegetal kingdom from the algæ (sea-weeds) through mosses, ferns, cryptogams to phenogams (gymnosperms, angiosperms).

3. In the animal kingdom from protozoans, amæba, radiate, mollusk, articulate, vertebrate, comprehensive types ever-expectant, fishes, reptiles, birds, marsupials, true mammals—man.

4. That this progress was ever marked by increasing cephalization, until it was complete in *man*, and no further evolution *on this line* seems possible. What now? Must the evolution stop here? The law of continuity will not admit this conclusion.

Observe that as evolution in the inorganic proceeded, a beginning was made on a new line, the *vegetal*, complete in the angiosperm; and that, as this was proceeding, a start was made on still another new line, the *animal*, complete in man. What now does the law of continuity demand but an evolution on still another line? The question now recurs: Have we any evidence in nature going to point

out such an evolution? We must look for it in man, if anywhere, and, if successful, should find him possessed of the characteristics of the comprehensive type.

§ 63. And in studying man, we are at once struck with a certain duality of nature. On the one side he is intensely animal, filling completely our every conception of an animal—eating, drinking, sleeping, waking, busy with the things seen, coming into the world, assimilating food, growing up to maturity, becoming old, dying, like all other animals; but these, all of them, seem to rest, find happiness, in the satisfaction of mere animal wants. Not so with man. In him alone we find a certain restlessness—a want of something, he knows not what—a struggling onward after rest, contentment, and never finding it in the most abundant fullness of satisfied animal wants.

We find in him, *in nature*, a somewhat above nature. The process of evolution has reached a point in cephalization where *mind* appears in magnitude and grandeur, reaching entirely beyond the mere intellectual; a mind of a nature, and having faculties impelling a certain groping in the darkness of the unseen, eagerly searching for he knows not what. Here is manifestly a comprehensive type, a prophecy of something yet to come, the beginning of an evolution on an entirely new line. Let us now proceed to examine whither this evolution, under the law of continuity, will lead us.

§ 64. *Intellect.* In the first place, we find a reach, a strength, vigor, grandeur of intellect far beyond any want or need of the mere animal. Restlessly inquiring into nature's laws, he has indeed, as commanded, at length ruled, subdued the world, animate and inanimate; has brought all things in subjection under himself. He has harnessed the steam and the lightning, and made them obedient to his behests. His steam-ships plowing every sea; his heavily laden trains—with the speed of the wind, crossing plain and valley,

plunging through the mountain-chains, disdaining the labor of surmounting their dizzy heights — connect ocean with ocean. By telephone and telegraph he anticipates the flight of time itself. The merchant in New York, at his early morning meal, reads a dispatch from his correspondent in London, sent the afternoon of the same day. Having canvassed the visible things of the natural world about him, which have, in magnitude, relations to himself, he invents the microscope, and lo! a world of things invisible to the natural eye stand open to his gaze; and thus he explores the habits, the laws of life, the nature of living beings so minute that forty thousand million of them would find ample room in his wine-glass. And having thus conquered to science the world in which he resides, he makes for himself the telescope, and explores the depths of the lunar volcanoes, the continents, isles, and seas of our next door neighbor, Mars. He sees an apple fall in his garden, and straightway the laws of planetary and cometary motion stand revealed. All worlds and all systems of worlds are, to him, brought under law. His spectroscope tells him that all the worlds are made of the same materials as his own farm and garden. He finds that this earth, for a little while his abiding-place, that erst seemed so large, is but a very small member of a vast multitude of worlds that no man can number, no mind of man conceive, to all of which the very same laws that govern earthly things extend. Now he finds himself a mere infant in the great family of his Father, with elder brothers innumerable, angels, cherubim, seraphim, thrones, dominions, powers, joying all in his Father's love. Thus disdaining the narrow bounds of his earthly home, we see him claiming citizenship in all the universe of God.

And now we pause to ask: "Is this the adaptation we have seen in all living things?" In all others we have found adaptation so complete, as to leave no place, either

for want or surplusage. What vast surplusage do we not find here, if man be only an animal? In that case, the very ox that draws his wain is happier than he—yea, and far better off. In view of all this we ask: “Is this the work of nature, or of the God of nature? Have such stupendous powers been vested in a mere animal?” It verily seems like building a man-of-war for navigation of a mill-pond.

§ 65. What is the verdict of science in this aspect of the case? In all other living beings the law of perfect adaptation holds. Science, under the law of continuity, affirms—cannot but affirm—that the law of adaptation holds here also, and if so the conclusion seems inevitable that man is not a mere animal, there must be in him something much beyond, above the animal; we must expect to find in him a comprehensive type, a prophecy of something grand and glorious yet to come, commensurate with his powers and yearnings, the beginning of an evolution on a new line.

Will nature tell us nothing of the nature and the whither of this new line of evolution? Let us see.

In passing from the consideration of man as an animal we have noticed the massiveness, the grandeur of his intellectual stature, unmistakably separating him from all other animals. Let us now proceed to examine the natural features of this wonderful being under another aspect.

§ 66. **Man's Moral Nature.** We have said he has a dual nature; he has other features beside his vast intellectual capacity clearly indicating this duality—that is, a *moral nature*, definitely distinguishing him from all other animals, and entitling, compelling science (as we shall see further on) to classify him in this regard, not in a subdivision of the animal kingdom higher than mammals, but in a separate kingdom—the spiritual kingdom. The moral nature in man is a faculty, if it may be so called, that discerns between right and wrong, the just and the unjust, the mor-

ally beautiful and the morally ugly; it cognizes, in a sense different from what can be affirmed of any animal, the scope of the *ought* or the *ought not*.

This moral faculty evidently and widely distinguishes man from all animals, and necessitates for him a distinct classification. It has manifested itself in all ages, everywhere and under all conditions of the race; no sane man has ever been found without it in greater or less degree.

While all animals are impelled by instincts to the course of life to which they have been adapted, and necessarily obey these instincts, we never predicate guilt or sin of them. But of man this cannot be said—the case is different; for while he undeniably has instincts that ever impel him in certain directions, he is not of necessity obedient to them, there being in his nature a somewhat higher and stronger than instinct, a reasoning faculty, and a moral nature that often overrides the instinct, and strives to make its voice heard in his wildest and most erratic excesses. Man, in all ages, and among all nations and tribes throughout the world, has, it may be well affirmed, *generally* given loose rein to his lusts, passions, appetites, until by heredity and by habit he has fallen into an appalling state of *unnature*. In rebellion against the monitions of his better nature, the laws of society, the government under which he lives, the God who created him, he has too often become a very wild beast, spreading desolation and ruin around him. And here be it noted that no other animal can fall *below*, as it cannot rise *above*, the plane of its nature; but with man it is otherwise, as he can, and often does, fall far, very far, below the plane of humanity, even to the level of the brutes, which in his insane fury he wantonly maltreats and slays.

Is not this a suggestive fact? An ebb always in nature indicates and, indeed, *necessitates* a flood tide. As far as the waves of the sea fall below the mean, so far must their

crests tower above that mean. So if man may, and often *does*, fall so far below the mean of his nature, we should infer that he *also may* rise as far above that mean.

§ 67. **The Will.** It may be asked, Whence this terrible fact? this degradation, collapse, and deplorable state of un-nature into which man has fallen? It is because he is not a mere animal, but is much more than an animal; he is a power, the lord of nature, able to subdue it and bring it under his control; has a *will*—free, untrammelled, royal, able to determine for himself (in despite of instinct, of passion, appetite, lust) his own destiny. After all that has been written upon the subject of the freedom of the *will*, we return to, and insist upon, the simple fact that every one is *conscious* of its freedom; he *knows* that he can *will* or *nil* in any given case, and since to consciousness lies the ultimate appeal, its verdict must be received as final.

CHAPTER X.

§ 68. **Appeal to the Law of Instinct.** We have seen that the law of instinct is universal in all animal nature; that there is no animal without its instincts, and that every instinct is adjusted to somewhat in the animal's environment answering thereto, without which the instinct could have no existence.

We proceed now to inquire, Are there any elements in human nature so universal, so persistent as to compel science to regard them as *instincts*?

We unhesitatingly affirm that there are such elements, and we instance as evidence the instinct of *prayer*, affirming that man is naturally a *praying animal*—that this instinct has always and everywhere been an element of man's nature. No race, no tribe of men has ever been found without it. All men—enlightened, civilized, savage—have been addicted to seek aid, to ask help from some real or imagined superior being or beings in the time of need or of danger. No race has sunk so low, no race has risen so high as to be bereft of this instinct. We affirm without hesitation that even individuals of enlightened races, who have intellectually persuaded themselves that there is no God, nothing higher or beyond the visible universe, in the hour of extreme peril are led instinctively to pray. Who has not heard of the infidel's prayer, "O God (if there be a God), have mercy on my soul (if I have a soul)?"

But the objector will say: "This is mere heredity, and therefore proves nothing." Indeed! does it not? If it be universal, and still from heredity, it proves beyond doubt that the progenitors of all races were praying animals. But it matters not whence the instinct; all instincts of all

animals are hereditary, and still the law of instinct holds *in all and everywhere*. By the authority of what rule of reason, we ask, can this single instinct be considered an exception to an otherwise universal law?

Referring to Mr. Spencer's definition of life (Section 22), we remark that if any correspondence fail, then in that respect the animal is *dead*. Thus an animal having no eyes is dead to light; but under the law of heredity it would happen, if its ancestors had eyes, that an instinct of the lost power would remain, and consequently a certain unrest, from a failure in the correspondence natural to the animal in that particular respect, would result. Just this, we take it, is the case with man; his instincts of prayer, worship, and accountability (to be considered presently) are what remains of a faculty belonging to the progenitors of the race, whereby they had a consciousness of the divine presence—communion with God—which constituted their spiritual life. This consciousness being lost through their lapse from a state of rectitude, there remains, under the law of heredity, these instincts looking out, searching restlessly for their natural correspondence in the unseen environment. Science, it seems to us, is compelled by its great law of continuity to predicate of this instinct as of all others; it has its correspondence, is adjusted to something in the environment. But manifestly there is nothing in the visible environment answering to it; indeed, there cannot be, from the very nature of the instinct.

It must be admitted, then, by true science to have its correspondence in the invisible environment, to be adjusted to a power in the *unseen universe*, even to the "force that makes for righteousness," which science is compelled to recognize. But men do not pray to a *wall*, to dead matter, or to *deaf* force; the very nature of the instinct forbids this, makes it even absurd. This instinct, then, brings man face to face with God, the infinite Creator, and presents the whole race

standing uncovered before him, and looking face toward him expectantly.

§ 69. *Instinct of Worship.* We proceed to consider very briefly another element of human nature, so universal as to entitle it to be regarded as an instinct. We allude to that in man, manifested in all races and all ages, that leads him to *worship* some real or imagined supreme being or beings, or things which are conceived to represent such being.

We note a strong evidence of this worshiping instinct in the positivists of to-day, who, having dethroned God, striving to blot out the very idea of his existence, have found it necessary, impelled by this instinct, to establish a worship of *humanity*. What stronger proof can be asked?

Since writing the above, we have read a paper on "Evolution of Theology," by Huxley (*Nineteenth Century* for April, 1886, p. 493), from which we make the following extract:

A theological system exhibiting the same fundamental conceptions respecting the continued existence and incessant interference in human affairs of disembodied spirits prevails, or formerly prevailed, among the whole of the inhabitants of the Polynesian and Melanesian Islands, and among the people of Australia, notwithstanding the wide differences in physical character and in grade of civilization which obtain among them. And the same proposition is true of the people who inhabit the riverain shores of the Pacific Ocean, whether Dyaks, Malays, Indo-Chinese, Chinese, Japanese, the wild tribes of America, or the highly civilized old Mexicans and Peruvians. It is no less true of the Mongolic nomads of Northern Asia, of the Asiatic Aryans, and of the ancient Greeks and Romans; and it holds good among the Dravidians of the Dekkan and the negro tribes of Africa. No tribe of savages which has yet been discovered has been conclusively proved to have so poor a theological equipment as to be devoid of a belief of ghosts and in the utility of some form of witchcraft in influencing those ghosts. And there is no nation, modern or ancient, which even at this moment has wholly given up the belief, and in which it has not at one time or other played a great part in practical life.

We have here from Mr. Huxley a statement of the *universality* of the *worship* of invisible beings, which certainly justifies our claim that it is an *instinct* of humanity, and indeed in the same paper Mr. Huxley calls it an *instinct*.

§ 70. **Instinct of Accountability.** There is also found in all men in all ages what may be called an *instinct of accountability*. It cannot be denied that mankind has always given evidence of this feeling—not simply accountability to one another, to society, and to the government under which they were living, but to an unseen power; to the God or gods who had, or were imagined to have, control over the destinies of men. And with this consciousness of accountability there has always been manifested a consciousness of guilt—of sin—in recognition of not having been obedient to the divine laws, nor having lived in accordance with the *Supreme Will*. Hence the smoking altars, the sacrifices that have been offered from of old among all peoples. Search wherever we will, in the history of whatever people of ancient or modern times, this fact stares us in the face: Blood, for sin, has ever flowed upon millions of altars in every part of the world and among all nations. The question has ever arisen in the human heart, “How shall I propitiate the gods? Shall I give the fruit of my body for the sins of my soul? or will multiplied oblations suffice?” This instinct, for undoubtedly its universality compels its recognition as an instinct, cognizes a Supreme Ruler, whose law it is man’s bounden duty to obey. Now, remembering that under the universal law of instinct in any animal any instinct whatever has, and must have, in the environment, that to which it is adjusted—its correspondence—science must recognize in the environment a somewhat to which this instinct corresponds, and since there *is* nothing, there *can be nothing* to which it is adjusted in the visible universe, then its correspondence must be sought in *the unseen universe*. This instinct, then, also brings us face to face with God.

Before proceeding further in our argument, we pause to point out that all these elements in man's nature bring him into relation to the invisible; and, while they furnish us a broad, well-defined line of demarkation, unmistakably separating man from animals, they as certainly demand his continued existence in the invisible universe under the great law of continuity universally accepted by scientists.

§ 71. **Aspirations for Immortality.** We observe further, in addition to these instincts, and ever pointing in the same direction, that men in all ages have been possessed with the idea of a future existence. In utter ignorance of any thing beyond death—the catastrophic end of every living earthly organism—knowing nothing of the *how* or *whither*, yet there has ever been in the human heart a longing for immortality; a terrible fear of the catastrophe of what to mortal vision seems extinction, annihilation; a starting back shudderingly from the dark, the gloomy grave—among the conscience-stricken throng a terrible foreboding “of wrath and fiery indignation that is about to devour the adversaries;” among the righteous a glad expectancy of unspeakable blessedness that awaits them in the presence of their Lord.

In view of all this, we ask, Can science predicate such clumsiness, such great error in nature's otherwise perfect work? Do nature's great laws of adaptation, of instinct, of evolution, of continuity, hold universally, inexorably throughout the almost infinite chain of living organisms, from the protozoans to mammals, to man, and here suddenly break? We fail to see how science can find rest in such conclusions, such entire break in the law of continuity. Man as a mere animal would furnish the great exception; *but nature admits of no exception.* We affirm, then, in view of all this, that a just contemplation of nature herself leads inevitably to a reasonable certitude of man's immortality.

And herein we find pointed out unmistakably, as it seems

to us, the new line of evolution of which we have spoken before. It is in man's spiritual nature. The how? the whither? Ah! we see but dimly, vaguely along a line that stretches ever upward—"Beloved, now are we the sons of God, and *it doth not yet appear what we shall be*; but we know that when he shall appear *we shall be like him*; for we shall see him as he is." (1 John iii. 2.)

It has been objected that if life must be taken to be an entity, wherever found, and not a function of structured matter (as shown in Section 20), and if in man it must be recognized as being possessed of the attribute of immortality, then, wherever found, it must be taken to be possessed of the same attribute. To this objection we answer that it by no means follows, since we cannot say that all entities, not matter, are indestructible, and therefore immortal. It would appear probable, indeed, that though immaterial it is indestructible; and this may be true of all life, and yet there be no immortality as we understand the word, since this includes the idea of conscious personality as well as indestructibility.

Man *has* the attribute of *conscious personality*, and it is by no means certain that any other animal has. Besides, it will be noticed that we claim that *nature* teaches man's immortality, not because his life is an *entity*, but because the attributes of this *entity* imperatively denounce his classification in a kingdom higher than the animal, even among the immortals, leading us to regard the physical organism not as the very man, but rather as his vestment—his habitation for a time only—while the very man, the *Ego*, is a spiritual and immortal being. Besides, science leads us to predicate indestructibility of all entities as well as of matter of force, of energy; and therefore by a parity of reasoning, of the entity, we denominate *life*.

CHAPTER XI.

§ 72. *Duty of Science.* We fully recognize that it is the *right*—nay, we go further and admit that it is the *duty*—of every man of science to account for all phenomena of nature by the forces known to reside in matter, living or dead, so far as possible, and to build his theories solely on the known laws of material things. But when tentative theories accounting for the phenomena of nature have been proposed, however beautiful, however rational they may appear, we hold that it is his bounden duty likewise to put them to the test of experiment whenever possible; to examine carefully whether they are affirmed or contradicted by known facts of nature, and, where the testimony of facts is adverse to the theory, it is his duty to seek for some other explanation of things. The theory so contradicted cannot be true.

Therefore, while we do not fail to see the beauty, the intellectually satisfactoriness of Mr. Darwin's theory of the origin of species, we cannot receive it as accounting for the existing order of things, because we find it flatly contradicted by the records in the rocks. Nowhere do we find the innumerable links between species postulated by that theory. Nay; it may well be doubted if in any single case one such link is found. Further, the rocks bear abundant evidence that in numerous instances species appear without any known precursors—*e. g.*, the trilobites, by no means low among crustaceans; and in the sub-kingdom of vertebrates, the ganoids, during the later part of the upper silurian.

The fossils of the horse family, brought to light by Pro-

fessor Marsh, often quoted in support of the theory of evolution, are *generically* different, not specifically; and while we candidly admit that they render probable—scientifically certain, if you will—that the present species of horses was derived through that line, we utterly deny that they furnish any proof whatever of what is known as *the theory of evolution* from species to species by gradual change; since, as we have before shown, the rocks prove, if they prove any thing, that the passage from species to species was always *per saltum*.

Science, then, it would seem, must seek some other way of accounting for the order of things visible. And if she cannot account for the sublime order from the action of merely material forces, she must, as it seems to us, cognize a force outside the material resident in, and operating orderly through, these forces, and the recognition of this “force that works for righteousness,” even the Supreme Will, working all things according to the system devised by his own infinite wisdom, becomes inevitable. And why not? Has not science taken just such a step in the recognition of the luminiferous ether, impelled thereto by the phenomena of forces transmitted to earth from the sun, forming a conception of the nature of that *somewhat* from the phenomena?

§ 73. **Agnosticism.** In questioning nature at whatever point the scientist starts, and along whatever line he proceeds, he very speedily arrives at a point where further questioning finds no answer, beyond which all is dark—an abyss of utter darkness. Immediately around him he finds a small space fully illumined by nature’s truths and laws; beyond all is dark, whence no single ray of light meets his intellectual eye, no smallest whisper of voice meets his waiting ear. When he asks the *how* of things nature affords no answer. When he asks the *whence* of things the only answer he receives from nature is, “*Not from me.*” But when he asks the *why* of things, nature points with steady fingers to

man, the only solution; and when he further asks the *whither* of things, nature points, with outstretched hands, to the line of further evolution, sketched above, an ever-ascending line from evolution to advolution, through ever higher and higher realms of light, powers, dominions, principalities, until the ever-ascending line is lost to vision amid the transcendent glories of the throne divine. "It doth not yet appear what we shall be."

Herein is agnosticism; the scientist, fully recognizing *facts*, knows nothing of the *how* or the *whence* of things. Phenomena are patent to his gaze, but as to the how of things producing them he knows, he can know, nothing. So far he is agnostic. Is it not, then, irrational in him to ignore the being of God because he cannot know the *how* of his existence or the nature of his substance, while the phenomena of his presence are seen everywhere? Having eyes, he sees not; having ears, he hears not; and because the how of Him is, and must ever be, *unknowable*, he leaves *Him*, the only unconditioned Being in the universe, out of the category of things existent. Here is agnosticism with a vengeance. But we ask if the agnostic scientist leaves God out of his category, why does he feel compelled to recognize the existence of the luminiferous ether, which also is only known by its phenomena, being itself part of the unseen universe, and absolutely as unknowable as God himself, who likewise manifests himself everywhere in nature?

The agnostic, if we understand his position, refuses to accept the postulate of an infinite, omnipresent, *personal* God, because such a being is *unimaginable*. To such persons we simply reply that the *how* of all things existent is also unimaginable.

All scientists accept the chemists' doctrine of *atom*, because it is necessary to a comprehension of the laws of chemistry; yet the *atom* is utterly unimaginable. They accept the postulate of the ether, yet with the properties facts

compel science to assign to ether. It is also unimaginable. Science accepts the fact of gravitation, yet that takes its place in the same category. It is inconceivable.

The sense of direction possessed by some animals—as the bee, the homing pigeon, horses, cattle, dogs, cats, etc.—is a well-known *fact* in nature, and yet is utterly unimaginable by man, who cannot conceive of a sixth sense. Further, the existence of *matter* itself as to its *how*, or ultimate nature, is beyond the scope of the human intellect. It is also unimaginable.

Ehrenberg describes the Bilin Tripoli as composed of the shields of animals, forty billion of which are contained in a cubic inch, and science accepts the fact; yet they are certainly unimaginable. The infinitely small and the infinitely great are both unimaginable; yet science hesitates not to accept both in nature. Finally, the author knows of nothing in nature the investigation of which does not speedily bring the scientist to a point beyond which all is utterly beyond his ken, is unimaginable.

The refusal, therefore, to accept the postulation of an infinite, omnipresent personality, simply because he is unimaginable, is utterly unscientific. The only question science can properly ask is this: Do the facts and history of nature, as known to us, require this postulation? If so, science ignores her own *laws*, becomes *unscientific* by refusing to recognize his existence.

§ 74. In Section 3, page 10, the author quoted from Mr. Huxley as follows: “That if any one is able to make good the assertion that his theology rests upon valid evidence and sound reasoning, then it appears to me that such theology must take its place as a part of science.” And from Mr. Frederic Harrison: “We say that life and conduct shall stand for us wholly on the basis of *law*, and must rest entirely in that region of science where we are free to use our intelligence, in the methods known to us as intelli-

ble logic, methods that the intellect can analyze." We there, accepting the terms of both, proposed to establish *our theology* on "valid evidence and sound reasoning," claimed as necessary by the one, and on "the basis of intelligible logic," as required by the other.

Our theology, thus far considered, is very simple, viz.: (1) God Almighty, Creator of all things, infinite in nature, omnipresent, benevolent, infinite in goodness, joying in giving joy, immanent in all nature; (2) man, having an immortal spiritual nature capable of loving and serving God, his Creator and Benefactor, instinctively reaching after God, restless and unhappy till he find him, the *law* of whose spiritual being is to possess God and to enjoy him forever, advancing toward him in endless evolution.

Let the reader judge whether or not, on the terms specified, we have made our theology a part of science.

CHAPTER XII.

§ 75. **Retrospect.** Having followed thus far the line of investigation we had marked out, feeling at every step that we were treading on firm ground, and that nature herself bears clear, unmistakable evidence of man's immortality, before proceeding further in our argument to trace the new line of development or evolution indicated, we pause to re-trace briefly certain conclusions arrived at in the course of our investigation:

1. We call attention to the fact that while our system was being developed from the primordial nebulous matter, and while earth was still measurably inchoate, an evolution was started on a new line—viz., vegetal life was introduced in the *fucoi*, and while development proceeded on this line to culminate in the phenogam, evolution was started on still a new line—animal life began in the systemless protozoan to proceed progressively to culmination in man. Now we have seen that the law of continuity demands that evolution proceed on still another new line. The question recurs as to the *how* and the *whither* of this new line of evolution. Does nature tell us any thing of its beginning, nature, and direction? Let us see.

2. We have seen that evolution on the first line was of dead matter alone, *in preparation of a home for organic life*, and that the evolution toward a perfected world was carried on by the properties of dead matter assisted by living organisms under the directive agency of the Supreme Will.

3. And when a new line of evolution began to unfold in the vegetal kingdom, the material or stuff of the kingdom below (the inorganic) could not lift itself into the

kingdom above—in fact, was *dead* to it, could *know nothing* of it, and must ever remain so until the living organism in the kingdom above it, reaching down, laid hold of the dead matter, assimilated it to itself, and thus introduced it into its own kingdom.

4. So also when the new line of evolution began in the animal kingdom, the vegetal, having a *lower* form of life, was *dead* to that new life, could *know nothing* of it, could not possibly lift itself into the kingdom above, and must ever remain in this condition until the life of the higher kingdom, reaching down, takes hold of the vegetal organism, assimilates it to itself, and thus lifts it (transformed) into its own kingdom.

5. We have also seen that the law of biogenesis has been established as true beyond controversy. No life without antecedent life—true for *all kinds of life*, for this the law of continuity demands imperatively—all vegetal life from antecedent vegetal life, all animal life from antecedent animal life, and what hinders our going on to say *all spiritual life from antecedent spiritual life*.

§ 76. But before proceeding on this line of argument let us remark that as dead matter must necessarily be ignorant of vegetal life, and the vegetal be ignorant of animal life, being dead to it (see Section 23), so must the natural animal life in man—in other words, the natural man—be dead to the life in the higher kingdom, the spiritual kingdom, the kingdom of God. The natural man, then, *is* and *must ever be* ignorant of the life in what we call the kingdom of God until it be revealed unto him from this higher kingdom; nay, we go further, and say he cannot comprehend it when revealed unto him; he must needs enter into that kingdom in order to come to a knowledge of the kind of life its subjects enjoy. Just as matter must be born into the vegetal kingdom in order to *know its life*, and as the vegetal has to be born into the animal kingdom in order to *know its*

life, so must man be born into the kingdom of God in order to *know its life*.

Nay, *law* is exceedingly searching and far-reaching, and we may trace the parallel workings of this same law of life still further. Thus *dead matter* only is assimilated by the plant, and as the vegetal organism must die before it can be assimilated and come into possession of the animal life, just so this law of life tells us that the mind of the flesh, the carnal mind, in man must die before he can enter into the spiritual life, or rather this life take possession of him. But more of this further on.

§ 77. **Revelation Necessary.** It is manifest, then, that man cannot of himself attain to any *knowledge* of a life beyond the present, and, even should the *fact* become certain, cannot attain to any knowledge of the *nature* of that life—the life of the kingdom above him—cannot *know* any thing of the *line* in which the further evolution is to proceed. He needs, he *must have* a revelation from that higher kingdom of all that pertains to that life; and we may add that this he may assuredly expect if indeed there be any Being in that unseen universe that cares for his well-being, his happiness; and that there is such a Being the entire line of argument thus far goes to prove—indeed, makes certain.

We have nothing to do at this stage of our investigation with those systems of doctrine that claim to be revealed from Heaven to man. We have said that man may assuredly expect that God will in some way make known to him his will, if indeed conformity to that will be essential to man's happiness, as it most assuredly must be in the very nature of things. But the Infinite One cannot be shut up to a particular mode in making himself known to his creature, only always it must be under *law*. *

* The author recollects reading somewhere an illustration of this fact. While a missionary was preaching to an assembly of benighted

§ 78. A scrutiny of the conditions of the relation of God to his works, as made known by the great law of continuity, will lead us to correct conclusions on this subject, and point us unerringly to the new line of evolution which we have been led to postulate. We feel that in tracing out these conditions we shall be treading on holy ground, where our steps must be reverent, for we shall stand face to face with God, our Creator, while we essay to ascertain somewhat of his nature as revealed in his works.

And first, we remark that the visible universe, the product of his infinite wisdom and power, must be regarded as the embodiment, the crystallization of the divine thoughts, and, since thought reveals *character*, must tell us of God's character.

All things in the universe, visible and invisible, are, as we have seen, under the reign of law, which fact secures the harmony and beauty of the glorious cosmos—the outcome of his action in all the energies of nature.

Worlds of inconceivable grandeur, projected into space under gravitating laws, cycle within cycle, in paths immense beyond conception; solar orbs infinite in number, each with its retinue of planets revolving around some other distant sun, the completion of its orbit requiring millions of our years; and this central sun, with its vast family of suns with their retinues of planets, revolving around some still greater orb, and so on in numbers vast beyond conception. Behold the scientific conception of the vastness of the domain of God!

§ 79. Turning now to *one* of the innumerable family of planetary worlds—which but serves as a sample of all the rest, as continuity assures us—to earth, we ask what earth

heathen in the wilds of Africa, and telling them about Jesus, a woman in the congregation cried out: "This is he who has come to me. I didn't know who he was." The spirit of God had anticipated the missionary in the work of saving that woman.

has to tell us of God, and what answer does she give? We cannot particularize here—it were needless—but hear a voice coming everywhence, proclaiming the wisdom, power, glorious goodness of God, in the happiness for which all living beings were made, as we have seen in the articles on adaptation (Section 35, *et seq.*).

The forests of a thousand hills clap their hands to God; the oceans' rolling waves, with their unnumbered millions of happy living things, from the leviathan to his tiny food, roll his praise to either shore. From ocean, air, and land the glad sound comes up in glorious symphony, proclaiming the lavish kindness of earth's Lord and King. He is then "good, and his mercy endureth forever," evermore joying in giving joy, and blessing all his creatures. And observe that he is one and his law one in all the universe and the laws of nature are but the expressions of God's mind, his way of doing things, and therefore give explicit assurance of his character.

§ 80. The law of each species arises from the nature given it in its creation—the features of its structure, internal and external—so that the law of each is coeval with its creation, and this is absolutely true of every species in each of the kingdoms into which things are classified, whether mineral, vegetal, or animal.

In the mineral, for example, the law of each element is but the expression of the properties that distinguish each from all the others, as Oxygen, Nitrogen, Hydrogen, Carbon, Phosphorus, etc., differ in their properties, while all are controlled by the laws of matter as such, their peculiar properties determining their mode of action, *which is their law.*

The same is true in the vegetal kingdom, in all the species from the sea-weed to the phenogams; so that if any two individuals have the same characteristics, law, science, classifies them in the same species.

The same truth holds in the animal kingdom, from the protozoan—through trilobite, ganoid, reptile, mammal—up to man. Thus is the law of each being coeval with its creation.

§ 81. Again, as we have seen, continuity binds all things to order of harmony; the matter of the earth is the matter of all worlds, so that the same laws prevail throughout the visible universe, and, as continuity assures us, throughout the invisible universe as well. And as there are diverse orders of living beings on earth, so must there be different orders of living beings in all worlds; and as things *seen* on earth culminate in a race of immortal spiritual beings—the final cause of earth—so the law of continuity leads us infallibly to postulate of all other planetary worlds; and since spiritual beings have no *necessary* relations to matter, to further postulate of *space*, that *it* also is replete with immortal spirits, the happy servants and children of their Lord and King, rejoicing ever in his presence, doing his behests; and these also of diverse orders—angels, archangels, cherubim, seraphim, first-born sons of God, ever blessed with the light of his countenance—*their life*.

§ 82. We proceed to point out that the order and harmony of the material universe is maintained by the fact that matter is continuously under the law of gravitation, and that if that law should fail of observance by any world that world would rush to remediless ruin, and if suspended in all, the whole universe would be involved in irretrievable chaos and ruin.

And that vegetals only thrive when under the law of their species. The palm or banana could not thrive in Arctic regions, nor indeed in a temperate climate; they must exist under the *law* of their species, or be exterminated as the result of the disregard of that law.

Just so of all the unnumbered species constituting the animal world. The species of the tropics perish if trans-

planted to the north, those of arctic regions if removed to torrid climes; mountain species perish in a champaign land; and so on to the end of the chapter. No species of animals *voluntarily* transgress the laws of their existence, being controlled by instinct, which leads them infallibly in the path of their nature; and if *involuntarily*, they inevitably perish.

Thus speaks the law of continuity. Omnipotence itself cannot change the result without changing the *law* of the creature, *which would be changing the species*, since the characteristics of a species and its law are co-ordinate.

§ 83. Referring now to Mr. Herbert Spencer's definition of life (see Section 17), it will be seen that where the correspondences between the internal faculties and the environment do not exist—where the adjustment between the internal and external relations fail—there *is*, there can be, no life. This we have seen illustrated in the case of vegetal and animal life; the adjustment failing, life ceases—*that is*, the law of the creature's existence or nature being broken, life becomes extinct. As this is true in all physical nature, so also must it be true by continuity in the spiritual realm. The spirit's *life* consists in the adjustment of its faculties, will, sensibilities, and perceptions to its environment, which in this case must needs be the Omnipresent Spirit; so that substantially the spirit, though immortal, is dead, when out of harmony, not in accord, with God. While *in accord*, *in harmony*, perfect adjustment of the spirit with God is life and peace and blessedness forever. These are clearly the deductions of reason and sound logic in the premises, since intelligent spiritual beings must proceed from God, and must, therefore, in the measure of each, partake of the divine nature, bear the image of their Father.

§ 84. *Accord with God* is therefore the law of their being, and under the law of continuity must be their *life*. While in harmony throughout their being with God, they

live in the light of his countenance, and are perfectly blessed, while if this harmony be disrupted, broken, there is alienation from God; the correspondence ceasing, there is *death*; the adjustment between the internal and the environment being broken, they pass into darkness; the light of God's love no longer illumining, they are in outer darkness, ruin, death.

And what does this mean? It means that as God is holy, it is impossible for the unholy to enjoy him, have peace and happiness in his presence; that God being *good*, the vicious are necessarily at war with him; that God, joying in giving joy, the *selfish* must be at an infinite moral distance from him.

Thus, then, we see that accord with God being the *law* of intelligents, antagonism to him must necessarily be utter ruin.

§ 85. We reason thus on this subject, that as the creature of earth is endowed with organs of sense by which it is co-ordinated with material things, and has intercourse with its earthly environment, so the spiritual being must have somewhat to answer to these organs, must have faculties by which *it* is co-ordinate to its environment—the Omnipresent Spirit. And as the organs of sense in the one, when in normal healthy condition, are avenues of pleasure, of delight; as the healthy eye is charmed by all the glorious beauty of air and earth and sky, of flowery mead, and forests of the plain and mountain; and as the ear is delighted with the harmony of music, when in normal state; and as, when the eye is inflamed, light becomes the source of intolerable anguish, and when the ear is diseased the sweetest music becomes as jarring discord, source of acutest pain, just so must it be with the spiritual essence. When all correspondence with, all adjustment to, God, its environment, has failed; when its spiritual faculties, no longer in their normal state, have become diseased, the very *presence* of God must become a source of intolerable anguish—

it must needs strive to get away from God, must prefer rather the outer darkness to the light of his countenance, no longer *light* to that spirit. God has become to it "a consuming fire."

§ 86. Following this line of thought, we find that *man's law* arose from the nature given him in his creation, and that this nature proceeding from God must have partaken of his character. Man must have been holy, pure, good, liberal, just, loving God and all his fellow-creatures—must needs have borne the image of his Father, God. Man could not have begun in a state of savagery, as some imagine, and since the historic period be slowly emerging therefrom.

Our great law of continuity leads us, by the laws of logical reasoning, to this conclusion: He must be a fallen creature; must now, as we have affirmed elsewhere, be in an appalling state of unnature—fallen from his high estate—or else, what? Why, *he must be an anomaly, the only one in all nature*—must in his own person present the *great exception in nature's otherwise perfect laws*. This conclusion the established law of continuity, established as the very foundation of science, utterly prohibits.

§ 87. Let us now, in the light of these conclusions, endeavor to point out the new line of evolution which we have predicated of him.

Now and here we find him, as we have before shown, of dual nature—animal and spiritual; the animal with its passions, lusts, instincts, looking only to earth and earthly things, destined to meet after a little while the inevitable catastrophe of all other living things of earth; the spirit, co-ordinated to earth through and by the physical nature, yet itself an immortal entity thirsting for truth, with an intellectual nature searching into the laws of all being, enabling him to dominate all things in his earthly environment; with spiritual instincts inherited from his earthly

progenitors, ever reaching after God "if haply he may find him" (Acts xxvii. 27), and yet obscured, overridden by the things of the flesh, if without help—certainly in a deplorable condition; still, ever having a certain feeling of want, restlessness, longing for he knows not what; never satisfied, expecting, hoping, in his insane delusion, that he will find satisfaction and rest in power, wealth, pleasure—all in vain, as witnessed by the universal experience of mankind. As to earth, the conclusion of the whole matter is, "all is vanity and vexation of spirit."

§ 88. In this condition we find in him the lost child, the prodigal son who has squandered in riotous living all his father's goods given to him for improvement and continual betterment. But what of the Father? Can *he*, the infinite, the blessed One, behold all this continually in all his children of earth, and make no move, do nothing to help them up out of their ruin? The law of continuity will not permit such conclusion. He must do all that is possible to be done *under law* to retrieve the ruin. And this, we are sure, he does in the case of every individual of the lost race, his spirit ever striving to deter from evil and to allure to good, to lead the lost child to his Father's bosom.

§ 89. Further, we have seen the line of evolution from protozoan to man was ever in increasing cephalization—enlargement of brain capacity—the working implement of *mind*; and since there can be no further evolution on this line, no higher tribe than man, the further evolution must be found in *man himself*, in the increase and growth of the spiritual entity in all that constitutes the wealth and glory of being—increased nearness to God—in the exalted realm of spiritual existences.*

And as the evolution must be under *law*, it becomes nec-

* Man certainly presents in himself an example of the comprehensive type of which we have spoken before.

essary to recur more minutely to man's law as a spiritual entity. First we find in him a capacity for God; that the divine Creator has endowed him with capacity of receiving more and more of the divine effluence, so far as we can see, without limit; that there is a holy of holies in the human soul, a temple to be filled by God himself, that no created being can fill.

§ 90. Second, that God being driven from this temple by its defilement, there results what we have called an instinct Godward—a looking, searching, longing for God, leading to prayer, worship, and an effort to atone for sin.

Third, that the law of man as a social being was necessarily a *law of love*—love leading to the establishment of the family and all that is meant by this relation, the union of families in organized communities, etc.

Fourth, a consciousness of the obligation of the *ought* and of the *ought not*, a consciousness of the radical distinction between right and wrong, virtue and vice; and finally an emotional nature, capable of being stirred to its depths by the *true*, the *beautiful*, and the *good*, and moreover eminently plastic in its nature; and to all this we must add, as directing, controlling the whole fabric of his moral and physical nature, a capability of deciding his own destiny, an absolute uncontrollable freedom of *will* that Omnipotence itself cannot, *under law*, destroy; and when we further observe that, in fallen man, this will is by an *unnatural* nature adverse to God—alienated from him—it will be seen that all spiritual betterment must begin in the turning Godward of this royal, reigning will.

§ 91. This turning of the *will* to seek and serve God must then, in the terribly lapsed condition of fallen man, be the starting-point in the new line of evolution which we have been led to postulate of the ruined race; the child must be led to say, "I will arise and go to my Father;" he must determine to seek to know his Father's will, and as far as in

him lies, *to do* that will. And reasoning from the relation established between God and his creature, whose entire destiny depends upon his attaining to a knowledge of the divine will, and a determination to seek to do that will, we are necessarily led to the conclusion that God will, in the case of every child of man, do all that he can do *under law* to lead him to this decision, and wherever he fails to accomplish this result it must arise from the perversity of the individual—the determined antagonism to God and right and duty, the allurements of pleasure and passion and lust—the “lust of the eye and the pride of life” keep back the lost child from being enfolded in the loving Father’s arms. We further observe that this *will* to serve God being present, the Father’s help may surely be expected, because it is sorely needed, and will necessarily be asked. Man has, as we have seen, the instinct of prayer, and no longer prays to he knows not what, but goes to his Father for the supply of all his needs; and thus, by his Father’s help, is led to the practice of virtue, and to all acts of piety, to devout worship—is, indeed, transformed by the renewing of his mind, and becomes, so far as his internal state is concerned, a *new creature*—and now first he attains to a *knowledge* of spiritual life, now his affections are drawn Godward, he loves God his Father, and his fellows all as his brethren, the children of a common Father, and is restored, in his measure, to man’s normal condition, the first great *law of love*. And thus through prayer and worship and loving service of God, in the practice of all virtue and the avoidance of all vice, he becomes pure and holy, conformed to God’s will in all things.

§ 92. Referring now again to Mr. Spencer’s definition of life (Section 17), we find here correspondences of the internal with the external, between the faculties of the spirit of man and the envioning God, the highest conceivable life, a continuous adjustment of the “internal relations to the ex-

ternal relations;" and as these can in their very nature never fail, we have *practically* that which Mr. Spencer only *imagined* as a scientific possibility—viz., "eternal life and universal knowledge."

And while there may seem to men but little difference between him and other men during the life of earth, there is essentially a vast, an almost infinite difference, a difference extending to every fiber and ramification of essential character. The one is of the earth earthy, the other is living in loving communion with the Infinite One, the Lord of heaven and of earth; the one getting farther and farther from God, walking in darkness, the other walking in *that light* which is the life of men, advancing ever in swift progression nearer and nearer to God, allied more and more closely to his living Father, until he shall lay aside the "earthly house of this tabernacle," when, an immortal sanctified spirit, he shall enter into the open vision with the angelic host of the infinite God.

§ 93. And whither now this evolution? Animals on earth have had their culmination in their various tribes, followed by decline and extinction. But here we have an evolution in an ever-ascending line.

We may further observe, for hither are we led by our line of thought, that as the former evolutions of earth were by degrees with an untold number of grades between the fucoi and the phenogam on the one hand, and between the protozoan and man on the other hand, and an inconceivable distance in magnitude of mind; so there are innumerable grades between the state of the man at the moment of his resolution, "I will arise and go to my Father," when this new evolution began, and his final state, when, a disenthralled, glorified spirit, in the endless future he shall stand by the side of the first-born sons of light, the peer of the foremost of the heavenly host.

This is the eternal life and the universal knowledge *im-*

agined by Mr. Spencer, and *realized* in him who has entered this final evolution, which, in its ascending heights, is never to find a culmination. This is the outcome of our following the leadings of the law of continuity, and hence, the *reasoning being throughout scientific, and the logic intelligible, establishes our theology on the basis of essential truth as a part of science.* (Section 3.)

CHAPTER XIII.

§ 94. Having now established our theology, as we believe, on a scientific basis, we proceed to inquire if Christianity, as revealed to us in the scriptures of the Old and New Testaments, answers in any degree—and if so, how far—to the requirements of science. And, in the first place, we remark that these scriptures teach most clearly the existence and character of God, in agreement throughout with the deductions of science. “The Lord, the Lord God, merciful and gracious, longsuffering, and abundant in goodness and truth, keeping mercy for thousands, forgiving iniquity and sin, and that will by no means clear the guilty.” (Ex. xxxiv. 6, 7.) “My spirit shall not *always* strive with man.” (Gen. vi. 3.) Then his spirit *does strive* till man proves incorrigible. “Ye are God’s husbandry, ye are God’s building.” (1 Cor. iii. 9.) How clearly do these passages set forth God’s existence, and working to save men from ruin, as deduced by science from consideration of things made! And in the next place they (the holy writings) teach as manifestly the immortality of the soul, and set forth the *eternal life* most clearly to the children of men. “For I know that . . . though after my skin worms destroy this body, yet in my flesh shall I see God; whom I shall see for myself, and mine eyes shall behold, and not another.” (Job xix. 25–27.) “For this corruptible must put on incorruption, and this mortal must put on immortality.” (1 Cor. xv. 53.) “Who hath abolished death, and hath brought life and immortality to light through the gospel.” (2 Tim. i. 10.)

§ 95. And we go further, and say that the teachings of the Master and his apostles in the Gospels and the Epistles

will be found to correspond in every particular with the deductions we have made from a review of the laws of nature. Christianity, as thus revealed, must be received as the religion of science, as we now proceed to point out with greater particularity. But before doing so we recur to the definition of life as given by Mr. Herbert Spencer (Section 22), which, although telling us nothing of the *essential nature* of life, does clearly set forth the phenomena that proves its presence and well serves our purpose. From the principles established in Sections 22, 23, as deduced from Mr. Spencer's definition, noting that they are necessarily applicable to all life, we are inevitably led to the conclusion that the natural man (in his state of unnature) is, and must forever remain, dead to the life of the spiritual kingdom of God, since there is in him no correspondence of the internal attributes with his spiritual environment, no *adjustment* of "the internal relations to the external relations," which are the environing spirit of God, and we find this fact abundantly affirmed in the Christian Scriptures—indeed, lying at the very foundation of their system of truth. Thus: "She that liveth in pleasure is dead while she liveth." (1 Tim. v. 6.) "To be carnally minded is death." (Rom. viii. 6.) To be carnally minded is to be limited in one's correspondences to the environment of the natural, the physical man. "Arise from the dead, and Christ shall give thee light." (Eph. v. 14.) "Who were dead in trespasses and sins." (Eph. ii. 1.) "Even when we were dead in sins." (Eph. ii. 5.) "You being dead in your sins." (Col. ii. 13.) "But is passed from death unto life." (John v. 24.) But it is needless to quote further to prove the position of Jesus and his apostles on this point.

In predicating of the natural man that he is *dead*, we do not mean to be understood as affirming that he is incorrigibly wicked or a monster of vice, or, indeed, to affirm at all

of his character—that he is virtuous or vicious—but simply to point out that the fleshly mind, by its very nature, is enmity against God—has no correspondence with, no adjustment to him, the very fountain of life. This carnal mind has life most certainly, but it is wholly of earth, and tends earthward continually, and is, in fact, of so low a nature when compared with the higher, the eternal life, as not worthy to be called life at all. To this truth, we further remark, the testimony of the modern world gives abundant witness. What is the modern system of agnosticism but a sad testimony to this truth? They recognize not God, proclaim him unknowable; but what is this proclamation but a confirmation of the testimony of Paul, that “the natural man receiveth not the things of the Spirit of God, for they are foolishness to him; neither can he know them, because they are spiritually discerned?”

§ 96. **The New Birth.** Hence we see the scientific necessity of the great truth announced by Jesus, “Ye must be born again.” Ye must enter into the higher life, or rather the higher life must enter into you. “Unless a man be born from above [for this is the meaning of *ἀνωθεν*], he cannot enter into the kingdom of God.” As the mineral cannot enter into the plant life unless the plant life reach down and lift it up into its own kingdom, thus making it partaker of the plant life, it must remain dead—a mere mineral forever; and as the plant cannot enter into the animal life, nor become partaker of that life, unless the animal life reach down into the vegetal kingdom and lift it up into its own kingdom, making it partaker of the animal life; just so the natural man cannot be partaker of the life of the higher kingdom, the spiritual kingdom of God, unless the life of that higher kingdom, descending, lays hold of his spiritual organism and, lifting it up, makes it partaker of its own life. This is more, much more than mere analogy—it is *law*, even a scientific necessity. Thus does natural law

affirm the teachings of Jesus on this point of *supreme importance*, because thus only can man enter upon that new line of evolution that our discussion has led us to postulate. Observe that Jesus says *cannot* enter. He does not say *will not*, but *cannot*, simply because a new birth is necessary to a new creature, which the Christian is to be; and hence it is the only gate of entrance into the new way, the new line of evolution which we are considering.

§ 97. **New Line of Evolution.** Having been brought into this new line of evolution, let us proceed to inquire what provision has been made for the Christian's continued life and growth therein. Shall we find this provision to proceed along the same line of *law* established for other kinds of life? As we have seen, the law of biogenesis holds here as everywhere, and the law of continuity demands that in every respect the universal laws of life should be found to hold.

The child, being born into the world, finds itself at once in correspondence with its environment; the eye in correspondence with light, the ear with sound, the lungs with the air, the heart with the blood, the stomach with appropriate food provided by the environment, and through the adjustment of internal to external relations it lives; and just as long as the correspondences continue it will continue to live. Some of them may cease and still it may live, but then only a lesser life. When others more essential to life cease, fail, life ceases. It is now dead, a mere thing to be put out of sight.

One of the most essential of these correspondences is doubtless that between the stomach and food, by which the animal organism is sustained in life. Through this correspondence food taken is digested and assimilated for the repair of the wear and waste inseparable from all material things, any surplus of assimilation going to growth, increase in stature, and complete manhood.

§ 98. Now a little consideration will show that the same law of life and growth holds in the spiritual life, and is definitely provided for and laid down in the teachings of Jesus.

In and through the new birth one comes into correspondence with, we were going to say, *a new environment*. Not so, however; he is only brought into new relation to an old environment, which he had not recognized previously—even the *essential life*, of which it has been said, “In him was life, and the life was the light of men.” (John i. 4.) This all-pervading life being that “in which we live and move and have our being,” is the medium which surrounds the new-born spiritual babe, with which its entire spiritual organism is brought into correspondence, breathing its air, assimilating its spirit, growing more and more into the likeness of the living Christ.

Here and here only we have correspondences, unfailing, of an immortal organism, with an eternal environment, perfect adjustment of internal and external relations—perfect, *eternal life* and *universal knowledge*, imagined only by Mr. Spencer, actualized in the Christian man.

§ 99. **The Bread from Heaven.** The proof of this? It is the simple and sole provision for continuance of life and for growth in the Christian system. “My father giveth you the true bread from heaven.” (John vi. 32.) “I am the bread of life.” (John vi. 35.) “I am that bread of life.” (John vi. 48.) “This is the bread which cometh down from heaven, that a man may eat thereof and not die. I am the living bread that came down from heaven; if any man eat of this bread, he shall live forever; and the bread that I will give is my flesh, which I will give for the life of the world. . . . Except ye eat the flesh of the Son of man, and drink his blood, ye have no life in you. Whoso eateth my flesh, and drinketh my blood, hath eternal life. . . . For my flesh is meat indeed, and my blood is drink indeed

He that eateth my flesh, and drinketh my blood, dwelleth in me, and I in him. As the living Father hath sent me, and I live by the Father, so he that eateth me, even he shall live by me." (John vi. 50-57, *et seq.*)

Again, is this mere analogy, and as such no proof from nature? Nay; it has been shown already to be the law of all life—that of the plant, that of the animal, and hence, under the law of continuity, that of the spiritual life.

We pause to ask in what other system of religion is this wonderful conformity to natural law found?

§ 100. Having now, as we believe, set clearly before our reader the nature and direction of the new line of evolution, which we have clearly revealed to us by the laws of continuity, and having seen how and how alone a man can enter upon that line through the birth from "above," we proceed to point out more fully, *under the law of life*, how the *persistency* of the eternal life is provided for in the Christian system. Of course it will be seen at once that exactly as the life of the lower kingdoms is preserved by assimilation of food appropriate to each individual organism, so the spiritual life can only be sustained by the reception and assimilation of the new-born babe's appropriate food. Paul calls it the "sincere milk of the word." Jesus declares it to be his flesh and his blood; he declares himself to be "the way, the truth, and the life"—the way, since through him alone we can *enter into* life; the truth, as the appropriate food of the spiritual entity; the life, since he dwells in and vivifies every one who truly believes in him. "Now *I* live, yet not I, but Christ that lives in me," says Paul.

Thus it is only by assimilating the living Christ that we grow into his image and likeness.

§ 101. **The Vine and Its Branches.** The living union between Christ and the believer in him Jesus sets forth under the similitude of a vine and its branches: "I am the

vine, ye are the branches ;” “as the branch cannot bear fruit of itself unless it abide in the vine, neither can ye unless ye abide in me.” Note that the living sap ascends through the vine into the branches, and thus, and thus only, they continue to live. Just so the Christian lives only by the life of Jesus in him, through which alone he is able to produce fruit, the real phenomenon that proves the life of the branch. Again, as the body cannot continue in life but by assimilation of food, so the new life must be sustained by *its* appropriate food. And we should as sedulously supply food to the new life within us as to the body ; otherwise the *life* cannot under the inexorable laws of nature continue, the starveling must necessarily perish. We must feed on God’s word, and ever, in prayer and communion, seek unto Christ our life. And, doing this, we need not be careful or anxious about our growth in him. “Consider the lilies, how they grow,” simply by being in the conditions essential to growth ; nature takes care that they grow. Just so the believer in Jesus, being careful to keep himself in the condition of growth, Jesus, his life, will take care of the growth. “Ye are God’s husbandry, ye are God’s building.” It only behooves the believer to see to the conditions of health, of growth.

§ 102. Again, referring to Mr. Spencer’s definition of life, having entered into the new correspondences that mark the spiritual life and become a new man, the Christian now hates what before he loved, and loves what before he hated.

And following the same line of thought, he not only should, but must cultivate the new correspondences, and as far as possible cut off, kill, the old ; those correspondences of the natural man that are hostile to the new life must be killed outright. “No man can serve two masters ;” the old man must be crucified with Christ, and buried out of sight. He must no longer walk after the flesh, but be led by the spirit

that dwells in him * Walking thus, the Christian grows up into his living Head in all things; makes progress in holiness, and becomes *complete* in him; is “changed from glory to glory, as by the Spirit of the Lord.”

It will readily be seen that the principles here laid down are in direct accord with the natural principles heretofore discussed in these pages—that is, are in accordance with the laws of nature. All in the new life, the new line of evolution, is governed by the same laws of life, in whatever domain we may consider them. As, for illustration, the assimilation of food is essential to the plant and to the animal life, so the assimilation of the food provided for the spiritual life is essential to the continuance of that life.

§ 103. And as *exercise* is essential to the strength and proper growth of the animal, so is *use* (exercise) essential to

* See how, in accordance with these deductions of science, Paul states the fundamental principles of the Christian system. “For the law of the spirit of life in Christ Jesus hath made me free from the law of sin and death. For what the law could not do, in that it was weak through the flesh, God sending his own Son in the likeness of sinful flesh, and for sin, condemned sin in the flesh; that the righteousness of the law might be fulfilled in us, who walk not after the flesh, but after the spirit. For they that are after the flesh do mind the things of the flesh; but they that are after the spirit the things of the spirit. For to be carnally minded is death; but to be spiritually minded is life and peace. Because the carnal mind is enmity against God; for it is not subject to the law of God, neither indeed can be. So then they that are in the flesh cannot please God. But ye are not in the flesh, but in the spirit, if so be that the Spirit of God dwell in you. Now if any man have not the spirit of Christ, he is none of his. And if Christ be in you, the body is dead because of sin; but the spirit is life because of righteousness. . . . Therefore, brethren, we are debtors not to the flesh, to live after the flesh. For if ye live after the flesh ye shall die; but if ye through the spirit do mortify [kill] the deeds of the body, ye shall live. For as many as are led by the Spirit of God, they are the sons of God.” (Rom. viii. 2, *et seq.* to verse 14.)

the spiritual growth of the Christian. "To him that hath shall be given;" and as in nature unused faculties are taken away (as sight from the cavern fish), so the unused grace shall be taken from the Christian—"take from him the talent, and give to him that hath ten talents," and "from him that hath not shall be taken away even that which he hath."

§ 104. We have in the preceding pages discussed those laws of nature only which seemed to bear directly on the matter under consideration. There are doubtless other laws which, if fully understood, would be found to bear valuable testimony to the same truths—the immanence of God in all things and man's immortality. To only one of them we invite attention—viz., to the great law of love which has been foreshadowed in much of our discussion, a law manifested in all things in the universe, visible and invisible; a law emanating from the very core of the divine nature, for "God is love."

This feature of the divine character, so clearly set forth in the Christian scriptures, leads us to inquire if it has not left its impress in law on his creatures. And on examination we find that it has done so, more or less clearly, so that it is presented to our contemplation as an established law of nature. And first it is seen in the sexual and family relations foreshadowed in the constitution of vegetal life, being especially manifest in the higher division of the phenogams, while its working is concealed in the cryptogams; it becomes markedly manifest in almost all tribes of animate beings, being concealed in a few only of the very lowest tribes, as in the cryptogams. Established as the working order of living beings, it is an essential attribute of the animal world, upon which very much of its happiness depends. This fact admits of unlimited illustration, but we deem it unnecessary to dwell further upon it, since the reader will at once see its truth.

§ 105. Outside the sexual and family relations the law is no less manifest; least so, however, among the tribes of preying animals, whose lives are generally (not always) solitary. Yet among these we often see manifested deep affection for the hand that feeds them.

Turning now to all other tribes of animals, we see the law strikingly manifested, as in gregarious animals—the herbivorous especially—who often assemble in herds, and manifest great affection and care for each other, in mutual defense from enemies, and in other ways; and thus, also, in innumerable species of other animals.

The law is, however, perhaps most strikingly manifested in those instincts that form communities, as in the various species of ants and bees, the individuals of the several communities often displaying the greatest affection for each other.

§ 106. Is this the law of humanity also? We think it is, undoubtedly, the most fundamental law of man's nature, though but a travesty of it is manifested in fallen man, he being, as we have before shown, in an appalling state of *unnature*; still, as human society is, and has been in all ages, the workings of this law may be seen among all races; many a Damon and Pythias have glorified humanity in all ages by their friendship.

But we have another view of the subject that, to our mind, demonstrates this to be the very primal and chief law of humanity. What if supreme love to God, as manifested in Jesus, and equal love to all men as to self, reigned in the hearts of all men? On what a gloriously high plane would not all the nations, tribes, and families of earth live! No more penal laws needed, no more cruel wrong, no more violence, assassinations, robberies, seductions; no more wars, standing armies, jails, penitentiaries, scaffolds.

This, then, must be the law of humanity, since, if obeyed, it would lift man to the highest possible state of happiness, would bring back again Eden to earth. We have seen in the

progress of our argument that all laws of animal life work to the happiness of the possessor; hence the inference is unavoidable that whatever tends most to this happiness in an animal species must be taken as a law of that species.

§ 107. We have already seen that the fundamental principles taught by Jesus and his apostles are in direct accord with natural laws, and we now desire to point out the striking conformity to *this law* of the same teachings. That it lies at the very foundation of the Christian superstructure—indeed, Jesus affirms the entirety of the law of God to be contained in two precepts—viz., “Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy strength, and with all thy mind; and thy neighbor as thyself.” Be it noted, Jesus laid down no new law in this regard; it was the old law from the very beginning of the human race. “On it hung all the law and the prophets.” He re-affirmed the law, and in his teachings applied it to the various relations of men to their God and to each other.

The law was always the same; but previously men in their lapsed condition did not find themselves in accord with law. They could not obey it, “because the carnal mind [mind of the flesh] is enmity against God; for it is not subject to the law of God, neither indeed can be.” How, then, shall men love him? how the impure love infinite purity? how the vicious love the infinitely good? how the guilty love the law that pronounces their doom? how the condemned criminal love the judge pronouncing the sentence of death? How, indeed?

The chief glory of Christianity lies just here. Not that it propounded a new law—that was impossible. *Man, to be happy, to fulfill his proper destiny, must be brought into accord with the laws of his being.** Happiness conferred in any

* To point out how scientific Christianity is in this regard, we quote but a single passage: “Seeing ye have purified your souls in

other manner would simply *unman* man; since to change the law of a species is, as we have seen, to change the species.

§ 108. The glory of Christianity, then, consists in this: That *it*, and *it* alone of all religions, makes abundant and adequate provision for man's restoration to accord with the primal law of his being. To this it is absolutely necessary that he should be born again—born from above, become a new creature, in that *now* he loves what before he hated. To love God and his fellows is now no longer against his nature, no longer difficult; the law is no longer a bondage; *to love* is now spontaneous with him, it is his very nature.

This is the very law of biogenesis—all life from antecedent life, vegetal life from vegetal life, animal life from animal life, spiritual life from antecedent spiritual life, and, under the law of biogenesis, that other *law of conformity to type*. “That which is born of the flesh is flesh; that which is born of the Spirit is spirit.” That which is born of the spirit of Christ bears the image of, partakes of the type, the very inner essential nature of the living Christ. And as he, from his very inmost nature, loved his Father with an infinite love, and our poor sinful human race with an unspeakable love, so every one that is born of him bears, *must bear*, the same love to God and man. And as by its fruits the tree is known, every man, whatever his pretensions, who does not exhibit in his life this loving character, must be set down as *not born of God*.

This is the personal experience of every one who has entered into this personal relation to Christ. His first impulse is overflowing love—love to God his Father, who has saved him from the conscious guilt, through faith in Jesus'

obeying the truth through the spirit unto unfeigned love of the brethren, see that ye love one another with a pure heart fervently; being born again, not of corruptible seed, but of incorruptible, by the word of God, which liveth and abideth forever.” (1 Pet. i. 22, 23.)

saving grace; who has put a new song in his mouth, and filled his heart with a joy unspeakable and full of glory, and to all men—all God's creatures—he longs to have all men enjoy the glorious baptism of the Spirit of the living Christ. And this loving, restful faith in God continues a permanent, ever-increasing possession, if only he keep himself in the conditions of continued life. (See Sections 92, 93.)

§ 109. Such was the condition of all the early converts to Christianity in apostolic days, and indeed in all the ages since. "Behold how these Christians love one another!" may be said of them in all ages. Such was the early Church; such is every true Church to-day.

But, it will doubtless be objected, the history of the Christian Church does not manifest this all-pervading love. True, sadly true, else the whole world would be Christian to-day. But the thoughtful mind will be at no loss for the reason.

That it is absolutely true, necessarily true of all Christians, we have shown. What then? Why, to be sure, all that are in the Church, that call themselves Christians, are not really Christians; many of them bear not one single mark of the Christian life and character.

It is a sad truth that wicked men, from motives of self-interest, having reference solely to worldly matters, have intruded themselves into the Church, as was indeed only to be expected, when to be thought a Christian is honorable and promotive of worldly prosperity; and unfortunately, such men, usually unscrupulous as to the means used, have succeeded in obtaining influence, rank, power in the Church of God. Christianity, then, must not be judged by the fruits borne by hierarchies which have deluged the earth with the blood of the martyrs, and cursed it by a bigotry and intolerance born only of the pit.

However dark, sadly dark, the history of the Church has been in the ages past, be it noted that in every age

there have shone forth thousands—nay, millions—of Christian men and women, whose lives demonstrated that they were born of the God of love.

§ 110. A little consideration will prove that abundant provision is made in the Christian system for bringing men into spontaneous subjection to this the first law of their nature—the law of love; that, indeed, it was the prime object of the gospel of Christ. Take it away, and there is nothing left. We have said that Jesus came to re-affirm the law and to *establish* it in the hearts of men; not to abrogate it, and thus relieve men of obligation to obey it; and this he accomplished by providing a means, through the use of which man's inner nature is attuned to harmony with the law, so that obedience to it becomes natural to him. It is not within our line of thought to consider *how* or on what principles this was accomplished, but simply to point out *the fact*, as it appears to us, that he *did accomplish it*, and that ever since the day of Pentecost every one who truly believes in Jesus, receiving him as his Saviour, *is, not will be*, so changed in his moral nature as to be entitled to be called a new creature; so changed as to bear more or less in his spiritual nature the image of Christ.

§ 111. To exhibit this fact fully as the teachings of the gospel of Christ one would needs quote very much of the Gospels and of the Epistles, in which it is everywhere insisted upon. We quote a few passages only: "By this shall all men know that ye are my disciples, if ye have love for one another." (1 John xiii. 35.) "Beloved, let us love one another; for love is of God, and every one that loveth is born of God, and knoweth God. He that loveth not, knoweth not God; for God is love." "Beloved, if God so loved us, we ought also to love one another." "If we love one another, God dwelleth in us, and his love is perfected in us." "God is love; and he that dwelleth in love, dwelleth in God, and God in him."

“There is no fear in love; but perfect love casteth out fear.”
 “We love him because he first loved us. If a man say I love God, and hateth his brother, he is a liar.” (1 John iv. 8, *et seq.*) “Owe no man any thing, but to love one another; for he that loveth another hath fulfilled the law.”
 “Thou shalt love thy neighbor as thyself. Love worketh no ill to his neighbor; therefore love is the fulfilling of the law.” (Romans xiii. 8–10.) “If any man be in Christ, he is a new creature; old things are passed away; behold all things are become new.” (2 Corinthians v. 17.) “For in Jesus Christ neither circumcision availeth any thing, nor uncircumcision, but a *new creature*.” (Galatians vi. 15.)
 “And that ye put on the *new man*, which after God is created in righteousness and true holiness.” (Ephesians iv. 24.) “And have put on the *new man*, which is renewed in knowledge after the image of him who created him.” (Colossians iii. 10.) Thus we see how strikingly Christianity conforms to the demands of scientific thought, answering at every point to the lines of natural law. Potential to bring back humanity to its moorings in the very core of nature, it must needs be true—such wonderful agreement in so many points cannot be merely casual. So plainly written are these great truths that he who runs may read.

§ 112. In the preceding discussion we have seen that the *new birth* is *essential* as being the passage from the *death* of sin to the life of God—the spiritual life, called in the Scriptures the *eternal life*. We now proceed to consider this eternal life more fully, hoping to throw clearer light upon it, under the scientific aspect of life as set forth by Mr. Spencer.

Referring again to his definition of life as “the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external co-existences and sequences,” with the remark before made that these correspondences *certainly are not life*, but *phenomena evidencing the presence of life*, we observe that the total

absence of correspondence is *death*; and that the degree of *life* is marked by the number and degree of the correspondence, and that perfect correspondence with the whole environment would be perfect life, as before laid down. Thus, in the protozoan, the systemless animal, a mere speck of structureless jelly in a sack, with no organs of sense, life must have existed in its lowest form, there being evidenced but a single correspondence with the environment—the sense of touch, perhaps—and when during the progress of evolution organs of sense were differentiated, life in a higher sense was evidently manifested; the number of correspondences was increased, while the degree of each correspondence was very limited, so that there was still a low form of life; and thenceforth the degree of the life was manifested more by the degree of the correspondences than by their number, since animals having five senses have the same *number* of correspondences with their environment; but these differ vastly in degree among the various tribes according to their habitation and the perfection of their organism. Thus, in the fish we find correspondences between the eye and the light immediately around; but the whole world above the water, full of glory and beauty as it is, is to the fish as though it were not; the fish is dead to it. Breathing through its gills, there is correspondence between its gills and the oxygen in the water; it is dead to the atmosphere and all the world above, etc. The eyeless fish of subterranean waters is dead to light, having no correspondence whatever with it.

The bird enjoys a much higher life than the fish, having a much higher correspondence with the outer world through the adjustment of its eyes to the light, of its organ of hearing to the music arising everywhence around, of the correspondence between its lungs and the free air of its environment, etc., while man, though he has only the same number of correspondences with the other higher animals, has

a much higher life than any other of them, simply because through his senses, with his faculty of reason, he has a much deeper insight into the nature of things than is possible for them. Through the correspondence between his eye and light the whole material environment is brought within his cognizance. Where the eagle sees only glimmering points of light, he sees revolving worlds—a glorious cosmos. And so of the rest of his senses in a greater or less degree.

Man's life is therefore higher than that of any other animal, and yet, being in correspondence only with the visible environment, this life is, after all, only animal; and if the visible be only a very small part of all that is, this life of his may be so low as hardly worthy to be called life at all.

§ 113. Let us look into this a little further. If a man have no eyes he is dead to light; to *him* it is as though there were no light in all the universe. If he is deaf he is dead to sound; to *him* it is as if there were no sound in all the world—no noise of moving elements, no song of birds, no music to cheer and gladden the heart—he is dead to all this. And so of smell and taste. He may lose all these correspondences, and still in some sense be alive; but he has a greatly curtailed life, and he may perchance live this life, dead to all the outer world, except through lungs and stomach; but when any one of the vital correspondences fails, he is wholly dead.

Now, to return to the thoughts above, if the *visible* be only a very small part of all that *is*; if it be but a mere fraction of the universe of God, and the least important part thereof; if it be but the portico, the vestibule of God's glorious temple, then the highest life possible from fullest correspondence with it is of so poor a quality as to be unworthy to be called life at all.

Now, observe further, if the man have no correspondence with the spiritual world, he is dead to that world, and if he have no correspondence with God, he is dead to God.

§ 114. But notice here that we cannot say, as before, that it is to *him as if there were no God*, since there is a relation here that appals us. Paul says, "Our God is a consuming fire." What does he mean? We have said that if a man be blind he is dead to light; but what if he have eyes, and they are so inflamed that he cannot see? Is it as though he were blind? Not quite. The light is now intolerable; it is torture to his diseased eyes; it is infinitely worse than being dead to light. And so if his organ of hearing be diseased, inflamed, it cannot be said that he is dead to sound; *he is not*, but all sound becomes a torture to him; the sweetest music thrills him through and through with keenest anguish.

Just so, if a man have no correspondence with God, while in the scientific sense he is dead to God, it is a terrible thing to him that God exists. Those senses of the soul whose office is to apprehend God, to correspond with God (commune with him), to enable him to bathe, as it were, in the ocean of the divine love, being diseased, become a source of intolerable anguish. No need of positive infliction of penalty for sin; nature avenges herself upon the sinner in a most terrible manner; to *him God has become "a consuming fire."* THIS IS DEATH.

§ 115. To return to our line of thought: Perfect correspondence *with the entire environment* is perfect life. And the man, being brought into correspondence with God, a relation that the Scriptures term *communion* with God, now possesses a fuller and a higher life, called by Jesus *eternal life*—not, be it noted, in regard to its *duration*, meaning thereby endless, though this it is, for the term is of *quality*, not *quantity*. It is the highest life possible, not to *man* only, but to all conditioned beings, since it is correspondence with the unconditioned, the Infinite One; henceforth the *degree* of life depends upon the *degree* of this correspondence. To this our line of thought leads us, that the

chief difference between the principalities, potentates, powers of the unseen universe must consist in their different nearness of approach to God.

Having shown how the new line of evolution is entered upon by attaining to a new life through a birth from above, it may now be profitable, following the same line of thought, to inquire how advancement on the new line is best to be made.

§ 116. Remembering that life is manifested by correspondences, and the nature of the life by the kind of correspondences, it will be seen that in the new birth, when the spirit of life from above enters the soul, and begets in it a life after its own type (Conformity to Type, Sections 27, 28), the old life that was in it was killed. Paul calls it the *old man*, and claims that in the new birth he was crucified with Christ, dead, and must (following the figure) be buried out of sight. Thus: "Knowing this, that our *old man* is crucified with him, that the body of sin might be destroyed, that henceforth we should not serve sin. For he that is dead is freed from sin." (Rom. vi. 6, 7.)

"That ye put off concerning the former conversation the *old man*, which is corrupt according to the deceitful lusts; and be renewed in the spirit of your mind; and that ye put on the *new man*, which after God is renewed in righteousness and true holiness." (Eph. iv. 22, *et seq.*)

"Lie not to one another, seeing that ye have put off the *old man* with his deeds, and have put on the *new man*, which is renewed in knowledge after the image of him that created him." (Col. iii. 9, 10.)

What is it, then? Seeing that life is manifested in its correspondences, if these be cut off the life that is manifested through them necessarily dies—perishes from want of nourishment. It behooves, then, the new man, born of the Spirit, having thereby entered into correspondence with God, to cultivate, keep up his correspondence with God through the vivifying aid of the Holy Spirit, that he may

get into fuller and deeper correspondence (communion) with God. And that he may do this, he *must* cut off, as far as possible, the correspondences of the *old man*, manifesting themselves in the “lust of the flesh, and the lust of the eyes, and the pride of life, which is not of the Father, but is of the world.” (1 John ii. 16.) The necessity for this to him who would live a godly life is insisted upon in the New Testament scriptures especially, thus: “Dearly beloved, I beseech you as strangers and pilgrims, abstain from fleshly lusts, which war against the soul.” (1 Pet. ii. 11.) “And they that are Christ’s have crucified the flesh with the affections and lusts.” (Gal. v. 24.) “But put ye on the Lord Jesus Christ, and make not provision for the flesh to fulfill the lusts thereof.” (Rom. xiii. 14.)

§ 117. Thus we see that the Christian system agrees at every point with the line of scientific thought.

The correspondences with the things of the world must be cut off, so far as they antagonize correspondence with God. “No man can serve two masters.” No man “can serve God and mammon.” “What agreement is there between Christ and Belial?” what “between the temple of God and idols?” “Ye are the temple of the living God.”

The biological law is that correspondences grow and increase in strength by what they feed on, by indulgence; and the godly man will, *must* keep under strict control all correspondences of an earthly sort, and cherish and promote correspondence with God by frequent repetition. *Herein lies his very life.*

Thus much on the repression of the correspondences of the *old man*, that the new man may grow in strength and in “the nurture and admonition of the Lord.”

§ 118. Having considered thus, at some length, the duty of the man who has entered the new line of evolution, to kill, repress in every way the correspondences with outward worldly things, so far as they tend to lead from God (the

negative side of the case), it would seem necessary to present at greater length, from a biological stand-point, the means of making progress along this new line. (Sections 89-94.)

It must be borne in mind that under the law of conformity to type (Sections 27, 28) it is the life that builds up the organism. The organism does not constitute the life; it is *not* a function of *that*, but an entity manifesting its presence in the protoplasm by its peculiar phenomena—that the life provides for the growth of the organism to perfection, each according to its type, the bird being the incarnation of the bird life, and so of all the myriad species of vegetals and animals, a universal law, nature in every case supplying abundantly, in the environment of each, all that is necessary to growth; the organism has only to avail itself of the present material, and the life does the rest. Thus the plant is surrounded by an environment containing air, moisture, CO₂, light, and heat, with soluble salts in the soil; and it has only to send out spicules from its roots and take in appropriate food. Life does the rest; it thrives and grows without labor or toil. “Behold the lilies, how they grow.” And so of every individual in the *animal* world. Nature has provided in the environment all that is needed for the healthy, happy existence of the animal. All *it* has to do is to take of the abundance supplied what is needed for its sustenance; having done this, the life takes it in hand. The animal, having nothing more to do with it, could not control its action if it would; the food is assimilated, and growth follows.

Just so, in the new birth, the life of the higher kingdom descending into the soul's protoplasm, forms it into a new creature after its own type, transforming it into the image of the living Christ, the holiness of love; and this new creature, breathing the atmosphere of the environing spirit of life, and assimilating its appropriate food, “the sincere milk of the word,” will necessarily grow up in conformity

to its living head in all things, making it an incarnation of the Christ-life. (Section 89, *et seq.*)

§ 119. Again, referring to biological law, the plant-life in a speck of protoplasm assimilates inorganic matter, and fashions it into a plant. Animal life in protoplasm assimilates dead organic matter, and fashions it into an animal according to its type; so then, under the law of continuity, must the spiritual life have a protoplasm in which to operate, building up in it and through it a living being after its own type. This is the law of all life, as we have seen; and, as in the case of the plant and of the animal, the substance assimilated and lifted into the higher life must be dead as to that life.

But it may be asked, What is this protoplasm into which the life from above enters? The substance of the protoplasm of the plant and the animal is *material*, and the substance assimilated is matter, and the organism physical. And so, since the life from above is spiritual, and builds up a spiritual fabric, the substance assimilated must be spiritual (mental).

The protoplasm, then, into which the life from above enters must needs be of a spiritual nature. And as we know nothing of the essential nature of the lower life, so we can know nothing of the essential nature of the spiritual protoplasm; and as the lower life is only known by its phenomena, so only by these can the higher life be known.

§ 120. The phenomena of the life in man are recognized in the mind and character, the will, the sensibilities, the affections, the moral nature. And as we have seen in the natural, the old man, all these are of the earth earthy, minding — having correspondence only with — worldly things. Now these are the clay of the potter, and the divine life entering into this clay must fashion it into a new man, so that in regard to these elements old things shall pass away, and all things become new. The analogy of

the operations in this line to those of the lower natural bios might be extended; but we forbear, and proceed to remark that the wondrous results may be obtained in a *new creature*. These elements must have two characteristics—viz., capacity for life and plasticity.

1. *Capacity for Life*. In organisms of earth it will be noticed that all matter is not capable of being assimilated by the life force, but certain elements only which have capacity for life. Now this is also true in this case. The protoplasm in man has a *capacity for God*. “Herein lies its receptivity; it is the very protoplasm that was necessary. The chamber is not only ready to receive the new life, but the guest is expected, and, until he comes, is missed.”

In every age and in every land the human soul has yearned for God—pined after him; “feeling after God, if so be that it may find him.”* (Paul.)

In fine, we cannot but regard *this* as the final cause of this glorious world of ours—a birth-place and training-school of immortals, who should after awhile join the innumerable throng of the blessed in the grand temple of which earth is but the vestibule.

§ 121. 2. *Plasticity*. “Conformity demands conformability.” Now these elements in man are eminently plastic, easily affected, and often imperceptibly, by extraneous influences; easily cultivated and strengthened in any given direction by the thousand influences in the environment of every one.

As well exhibiting the plasticity of the human soul and the influence of untoward environment, we insert an article which has recently fallen under our notice: “I live,” said

* “That they should seek the Lord, if haply they might feel after him, and find him, though he be not far from every one of us: for in him we live, and move, and have our being; as certain also of your own poets have said, For we are also his offspring.” (Acts xvii. 27, 28.)

a gentleman lately, "in a town near New York, and go to my business there and return daily on the same line of railway. The train in the morning and afternoon is filled with girls from ten to eighteen years of age on their way to and from schools in the city. They usually belong to families of the educated, influential class, and at home are carefully guarded from vulgar or vicious companions. They are not so guarded on the cars, and the result is soon apparent. For example, I remember about five years ago that a blushing little girl of fifteen was put on the train one morning by her father; her books were in an embroidered bag, and her ticket ready in her portmanteau. It was evidently the first time she had made the journey alone. She sat timidly in one corner, her color coming and going when the conductor spoke to her. She was a picture of innocence and modesty. After that she came down every day on the same train. In a day or two I noticed that she was listening to the chatter of the other school-girls, at first with a mixture of disgust and amazement on her shy face. Presently, as she became used to it, the disgust wore off, and she listened, smiling at their absurd gossip and jokes.

"In a week or two the conductor and brakeman recognized her as a familiar figure, and tipped their hats to her as she stepped on board. A little later they exchanged good-mornings and remarks about the weather; she apparently felt that civility required some answer. When, as weeks passed, the conductor, a vulgar young fellow, stopped beside her seat to ask what was her school, and make remarks on her text-books, the girl, though frightened and annoyed, did not know how to dismiss him.

"Before the summer was over she had lost much of her shyness and helplessness; she came alone to the train, jumped on board and marched into the car like the others, with an air of perfect *sang-froid*. The girl was not to blame. It was the natural effect of her daily journeys without protec-

tion. But the dewy bloom was fast going from the peach. In a year that girl entered the car as if it belonged to her, laughing and joking loudly with the other girls and the train-hands. She had lost all interest for me, and I ceased to notice her. One day, however, about a year afterward, the morning papers contained the account of the daughter of Judge Blank having eloped with a man who turned out to be a professional gambler. Their acquaintance, it was stated, began on the cars. It was the shy little girl. She might yet be shy and innocent and happy if her mother had not subjected her to the risks of that unprotected journey. No education can atone for the price paid for it in such exposure."

§ 122. Illustrative of the tendency of correspondences with things of the environment that administer to appetite to obtain control, dominion, over the man until he is helpless to escape thralldom, we make extracts from another article in the same paper. Here is an extract of a letter from a man to his brother: "Ah! my dear fellow, I have three little children and a wife whose child-like and innocent life should have led me to better things. Many a care and many a sorrow she has had since she married me, and many a time, God knows, I've been deeply penitent to have given her cause for grief. But I have the restless blood of a drunkard in my veins, and it carries me away to dreadful and disgraceful sprees. I promise, I swear off, I protest by all that's good and holy that liquor shall never pass my lips again; but all to no purpose. A craving, a devil, takes possession of me, and after weeks, or even months, of abstention I break out and degrade myself and shame my children, and heap misery on them and my wife. The old year is closing as I write, and the new comes up before me like an enemy. So much do I feel my weakness, that God may close my old life and open a new and better one to me is the cry of my heart to-night; for if I do not

find strength that the past gives me no hope of gaining, before the leaves of next summer wither I shall fill a drunkard's grave, and leave my wife and little ones to the mercy of the world."

"Surely that man never drank again!" He was a lawyer, with a large and lucrative practice. Read: The man is drunk again. "The little boys stole softly down, hand in hand, averting their looks of shame from the room where their father sat in a drunken stupor, and, standing by their mother, covered their faces in her skirts. . . . 'But you want to go upstairs, don't you, Randall, dear? don't you?' said Lucy (the wife) véry gently. 'Yes, I wan' to go 'pstairs; go'n' set baby down first and give her toys. . . . 'Baby want to kiss papa?' he said, and stooped lower; and then, before either of us could reach him, he fell forward full length, his whole weight crushing little Florry down. She cried out, and seemed to smother. The next instant he had rolled aside, and there the lovely little child lay bleeding at the mouth. The poor mother with a shriek lifted her baby to her heart. It sighed twice, and lay still. Randall by my aid had reached his feet. The unutterable horror of his face I shall never forget. 'Baby,' he said, stooping down; 'baby, look at papa; baby, just once, look at papa. O my God! Lucy, have I killed my little baby girl?' Even so it was. . . . We hardly knew when my brother recovered from the insanity of liquor, for it was followed by the delirium of brain fever. . . . He swore he would never look at liquor again, swore it by all that was good and holy. And even between his protests he said to me: 'I can't keep from it, Fred; I can't, it's too strong for me.' . . . The demon that he had dared trifle with never left him afterward, and, searching for him after an escape in the night, we found him half naked, face down, quite dead, in a ditch."

§ 123. It will be seen that there was absolutely no hope

for this man except in divine interposition, and that was not to be had, because it was not sought in the means provided.

The author knows a case strictly parallel except in its tragic end. Thirty years ago Judge D., residing in —, was a common drunkard and a profane swearer; to all human appearances hopeless to betterment. He visited a Methodist camp-meeting a few miles from his home. What occurred there the reader may imagine from the fact that after a day or two Judge D. returned home a new man—a man of clean lips and a clean life, and to the author's personal knowledge continues so to this day. An appeal to facts! For more than eighteen centuries no decade has passed when millions of men and women were not ready to bear testimony to the power of Jesus' name to save from sin.

§ 124. But we have digressed from the purpose in view—viz., having shown how the death of the old man is to be made complete, it is now our business to show how the new man is to grow to maturity and be perfected in strength and health, after which a few words on the *whither* of this new line of evolution will close our work.

How shall the Christian grow up into his living Head in all things? The law of biology will give a definite reply: First, by maintaining himself in the *conditions* of growth; second, by sedulously nourishing the new man with the appropriate food. This is his work, his sole work; the rest is God's work. The plant grows and thrives in its environment of air with its CO₂, moisture, heat, and light, simply by absorbing food through its rootlets in the fertile soil; its life takes care of the rest.

The animal remaining in its appropriate environment, and taking its appropriate food, grows to maturity, and is happy in its measure, the life-force taking care of its growth and the rest.

Just so, of course, under the law of continuity must the new man provide for healthy growth, maintaining himself

in correspondence with Christ, his life; keeping himself in the spirit, not only on the Lord's-day, but evermore; continuously, by prayer and worship, feeding the inner man with "the sincere milk of the word" and with "the bread that comes down from heaven." Doing this, he need give himself no care about the growth. The life that is in him will take care of this; it is not *his* business. "It is God that worketh in him to will and to do," while he works out his own salvation, simply by fulfilling the conditions as above given. "Ye are God's husbandry, ye are God's building." (1 Cor. iii. 9.) He cannot grow if he tries. "Can ye by taking thought add one cubit to your stature?" "Consider the lilies, how they grow; they toil not, neither do they spin, yet Solomon in all his glory was not arrayed like one of these. Wherefore, if God so clothe the grass of the field, which to-day is and to-morrow is cast into the oven, shall he not much more clothe you, O ye of little faith?"

§ 125. And the *whither*; what shall we say of that? We cannot see all along that line. It is an ever-ascending line. So much we see, but it is but vaguely after all. While on earth the man of God grows stronger in all virtue and holiness; he finds rest in his Lord; he possesses the peace bequeathed to him (John xiv. 27), flowing as a river, ever wider and deeper; complete in Christ, his Saviour (Col. ii. 10), "his joy is often unspeakable and full of glory. He has grown from a babe in Christ to the full stature of the perfect man, until his "perfected love has cast out all fear."

And is this his culmination? Other tribes of animate beings have had their culminations, followed by decline and often disappearance. But what is man's culmination? An ever-ascending line has no culmination. What then? Hear what the beloved disciple says: "Beloved, now are we the sons of God, and it doth not yet appear what we shall be; but we know that when he shall appear we shall

be *like him*, for we shall see him as he is." Like him! Is not that enough? Who can ask or think more? "Eye hath not seen, nor ear heard, neither have entered into the heart of man the things that God hath prepared for them that love him." What more? To what unspeakable height doth this evolution lead us? What? Only once do we catch a glimpse of those who have followed this line of evolution. After they have left the vestibule, and entered into the mansions prepared for the regenerated ones, and the man of Patmos, the beloved disciple, gives us that fair vision: "After this I beheld, and, lo, a great multitude, which no man could number, of all nations, and kindreds, and people, and tongues, stood before the throne, and before the Lamb, clothed with white robes, and palms [insignia of victory] in their hands; and cried with a loud voice, saying, Salvation to our God which sitteth upon the throne, and unto the Lamb." "What are these which are arrayed in white robes, and whence came they?" "These are they which came out of great tribulation, and have washed their robes, and made them white in the blood of the Lamb; therefore are they before the throne of God, and serve him day and night in his temple; and he that sitteth on the throne shall dwell among them. They shall hunger no more, neither thirst any more; neither shall the sun light on them, nor any heat." (Rev. vii. 9, *et seq.*)

Here we lose sight of man in this ever-ascending line of evolution. But is this the end? What saith the law in reference hereto—the law of laws, the law of continuity? Evolution, still ever ascending higher and higher, in the fuller fruition of the life in him; higher and higher, until the redeemed, sanctified one, in completest communion with his God, is lost to view amid the glories of the throne divine, the peer of angels, archangels, cherubim, seraphim, thrones, dominions, potentates, powers, the first-born sons of God, who forever bathe in the ocean of their Father's light and love.

SUPPLEMENT.

The author has briefly given in the preceding pages what he esteems the voice of nature in reference to man's immortality. To him the argument seems complete—nothing wanting. Surely God has not left himself without a witness in all nature.

But another short view of the whole matter has been of great benefit to himself, and this he adds here, supposing that some of his readers, who have not made a special study of the Christian evidences, may derive a like benefit from the argument it presents, from the internal evidences of the Christian revelation.

When yet in his teens, more than fifty years ago, being then a cadet in the United States Military Academy at West Point, being troubled with doubts as to the truths of the gospel, he found rest from all doubt in the following syllogism:

1. God wills man's greatest good.
2. Christianity *is* man's greatest good.
3. Therefore Christianity *is* God's will, and hence man's law.

Of the truth of the first promise he had no doubt, since all nature proclaims God's goodness in the abundant provisions made for the happiness of all creatures, as seen in their adaptation to environment, and in the law of instinct as briefly enough set forth in these pages. (See Sections 35-44.)

For proof of the second promise one must not look to the history of Christianity as seen in the histories of the Papal Church, or of any of the other Churches that have been es-

tablished among men, for reasons already given (see Sections 97–99), but to what *it is essentially in itself*, as declared in the teachings of its great Author and his apostles—*i. e.*, love to God and to man established as the ruling principle in the individual heart. “The kingdom of God is within you.” (See Sections 92–96.) It cannot be denied that if every man in the world were a Christian according to the measure of the Master, universal peace and good-will would be established among men everywhere, and Eden be practically restored. It hence seems evident that the universal reign of Christ in the human heart is man’s greatest good, and hence the conclusion is unavoidably drawn.

This argument would seem to be conclusive, even to the atheist, who, substituting nature for God in the syllogism, would reason thus:

1. Nature wills (if an impersonal can be said to *will*) the greatest good of all creatures.

2. Christianity (the dominion of universal love) is man’s greatest good.

3. Therefore Christianity is the law of nature for the human race.

The author commends this short view of the subject to all who have not the leisure or means of personal investigation into the Christian evidences, hoping that *they*, as he, may find therein rest from doubts.

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